



**A University of Sussex DPhil thesis**

Available online via Sussex Research Online:

<http://sro.sussex.ac.uk/>

This thesis is protected by copyright which belongs to the author.

This thesis cannot be reproduced or quoted extensively from without first obtaining permission in writing from the Author

The content must not be changed in any way or sold commercially in any format or medium without the formal permission of the Author

When referring to this work, full bibliographic details including the author, title, awarding institution and date of the thesis must be given

Please visit Sussex Research Online for more information and further details

# **The moderating impact of self-esteem on self-affirmation effects**

Camilla Düring

University of Sussex

Thesis submitted for the degree of Doctor of Philosophy in Psychology  
September 2014

### **Declaration**

The thesis conforms to an “article format”, in which the middle chapters consist of discrete articles written in a style that is appropriate for publication in peer-reviewed journals in the field. The first and final chapters present synthetic overviews and discussions of the field and research undertaken.

Chapter 2 of this thesis has been published in the British Journal of Health Psychology:

Düring, C., & Jessop, D. C. (2014). The moderating impact of self-esteem on self-affirmation effects. *British Journal of Health Psychology*. Advance online publication. doi:10.1111/bjhp.12097

The author contributions to this paper are as follows: Camilla Düring was responsible for all aspects of data collection, data analysis and writing the manuscript; Donna Jessop was responsible for providing feedback on study design, data analysis and the manuscript; Camilla Düring and Donna Jessop were collectively responsible for initial conception of the research.

I hereby declare that this thesis has not been and will not be, submitted in whole or in part to another University for the award of any other degree.

Signature.....

### **Acknowledgements**

First and foremost, I would like to thank my supervisor, Dr. Donna Jessop, for her guidance, expertise, patience and encouragement throughout every step of this process.

I would also like to express my gratitude to friends and colleagues at the University of Sussex, who have made this experience so enjoyable. In particular, I am so grateful to Sarah Laurence, Rebecca Grist, Una Mašić, Ella Graham-Rowe, Kerry Fox and Anna Good for their support, advice and friendship.

I am deeply grateful to my parents and sister, Göran, Yvonne and Jenny Düring, for their infinite support and love. I would like to offer my special thanks to Jenny Düring, who always takes the time to discuss my research and offers great advice.

Lastly, I could not have managed without the support from my partner Benjamin Herbert, who has been my rock throughout the ups and downs of the completion of this thesis. I will always be grateful for his kindness, support, sense of humour and love.

## Summary

Self-affirmation has been successfully applied as a technique to promote open processing of health-risk information. However, much research in this area has explored the uniform effectiveness of self-affirmation interventions. The current thesis adds to existing literature by exploring whether different aspects of self-regard moderate self-affirmation effects.

Study 1 ( $N = 328$ ) investigated whether global self-esteem moderated the effectiveness of self-affirmation at promoting openness to a message highlighting the risks of insufficient exercise. Global self-esteem was found to be a significant moderator. Self-affirmed individuals with low global self-esteem reported more positive attitudes and intentions towards increasing their exercise behaviour, together with less message derogation; there was no effect of self-affirmation for those high in global self-esteem. Study 2 ( $N = 166$ ) extended this research by exploring the moderating impact of a variety of self-regard aspects on self-affirmation effects. Contingent self-esteem emerged as a significant moderator. Thus self-affirmed individuals with low contingent self-esteem reported more positive attitudes and perceptions of control towards increasing their exercise behaviour; there was no evidence that self-affirmation promoted openness for those high in contingent self-esteem.

Study 3 ( $N = 139$ ) explored whether experimentally induced contingent self-esteem moderated the effectiveness of a self-affirmation manipulation at promoting open processing of a message detailing the risks of insufficient exercise. There was no evidence of this for any of the outcome variables.

Lastly, study 4 ( $N = 125$ ) investigated whether the moderating impact of global and/or contingent self-esteem on self-affirmation effects would extend to a message

detailing the risks of alcohol consumption. Both self-esteem aspects moderated the impact of the self-affirmation manipulation on perceptions of behavioural control regarding reducing the amount of alcohol consumed. Moreover, self-affirmation was associated with lower levels of alcohol consumption at follow-up for those with low global self-esteem, and with higher alcohol consumption at follow-up for those with high global self-esteem.

## Table of Contents

<b>Declaration.....</b>	<b>2</b>
<b>Acknowledgements.....</b>	<b>3</b>
<b>Summary.....</b>	<b>4</b>
<b>Table of Contents .....</b>	<b>6</b>
<b>List of Figures.....</b>	<b>9</b>
<b>List of Tables .....</b>	<b>10</b>
<b>Chapter 1: An Introductory Overview .....</b>	<b>11</b>
Overview .....	11
Self-affirmation theory (SAT).....	12
<i>Theoretical assertions of SAT .....</i>	<i>12</i>
<i>Self-affirmation manipulations .....</i>	<i>13</i>
Applications of SAT .....	13
Application of SAT to personally relevant health-risk information .....	14
<i>The capacity of self-affirmation to promote positive changes in cognitive outcomes.....</i>	<i>16</i>
<i>Inconsistencies in findings relating to cognitive outcomes.....</i>	<i>19</i>
<i>The capacity of self-affirmation to promote positive behavioural outcomes.....</i>	<i>19</i>
Moderators of the capacity for self-affirmation to promote open processing of health-risk information.....	21
<i>The moderating role of individual level of risk.....</i>	<i>21</i>
<i>The moderating role of aspects of self-regard .....</i>	<i>22</i>
<i>The moderating impact of global self-esteem on self-affirmation effects .....</i>	<i>22</i>
Aspects of self-regard under investigation in the thesis.....	26
<i>Contingent self-esteem .....</i>	<i>26</i>
<i>Self-esteem instability.....</i>	<i>28</i>
<i>Implicit self-esteem.....</i>	<i>28</i>
<i>Self-concept clarity.....</i>	<i>28</i>
<i>Narcissism.....</i>	<i>29</i>
Exercise and Alcohol consumption.....	29
<i>Exercise .....</i>	<i>30</i>
<i>Alcohol .....</i>	<i>31</i>
Choice of dependent measures .....	32
Overview of the current research programme.....	32
<b>Chapter 2: The Moderating Impact of Self-Esteem on Self-Affirmation Effects ...</b>	<b>35</b>
Abstract .....	35
Introduction .....	36
<i>Self-Affirmation Theory.....</i>	<i>36</i>
<i>Self-Affirmation Theory and Self-Esteem.....</i>	<i>39</i>
<i>The Present Research.....</i>	<i>41</i>
Method .....	42
<i>Participants .....</i>	<i>42</i>
<i>Materials .....</i>	<i>43</i>
<i>Design and Procedure.....</i>	<i>46</i>

Results .....	47
Discussion .....	56
<b>Chapter 3: Self-regard and self-affirmation: evidence that contingent self-esteem moderates self-affirmation effects .....</b>	<b>61</b>
Abstract .....	61
Introduction .....	62
<i>Self-affirmation theory</i> .....	62
<i>Evidence of the effectiveness of self-affirmation theory</i> .....	62
<i>Moderators of self-affirmation effects</i> .....	64
<i>Self-esteem as a potential moderator self-affirmation research</i> .....	64
<i>The present paper</i> .....	67
Method .....	67
<i>Participants</i> .....	67
<i>Materials</i> .....	68
<i>Design and Procedure</i> .....	71
Results .....	72
Discussion .....	81
<b>Chapter 4: Exploring the potential moderating impact of primed contingent self-esteem on self-affirmation effects .....</b>	<b>86</b>
Abstract .....	86
Introduction .....	87
Methods .....	91
<i>Participants</i> .....	91
<i>Materials</i> .....	91
<i>Design and Procedure</i> .....	96
Results .....	97
Discussion .....	104
<b>Chapter 5: Exploring the role of global self-esteem and contingent self-esteem as moderators of self-affirmation effects .....</b>	<b>109</b>
Abstract .....	109
Introduction .....	110
Method .....	114
<i>Participants</i> .....	114
<i>Materials</i> .....	115
<i>Design and Procedure</i> .....	118
Results .....	119
Discussion .....	129
<b>Chapter 6: Discussion .....</b>	<b>135</b>
Overview of background literature and research aims .....	135
Summary of Findings .....	135
<i>Study 1 (Chapter 2): The moderating impact of self-esteem on self-affirmation effects</i> .....	135
<i>Study 2 (Chapter 3): Self-regard and self-affirmation: evidence that contingent self-esteem moderates self-affirmation effects</i> .....	136
<i>Study 3 (Chapter 4): Exploring the potential moderating impact of primed contingent self-esteem on self-affirmation effects</i> .....	136



<i>Study 4 (Chapter 5): Exploring the role of global self-esteem and contingent self-esteem as moderators of self-affirmation effects.....</i>	<i>137</i>
Theoretical and practical implications of the research findings.....	138
<i>Global self-esteem as a dispositional moderator of self-affirmation effects .....</i>	<i>139</i>
<i>Contingent self-esteem as a dispositional moderator of self-affirmation effects..</i>	<i>141</i>
<i>Lack of evidence for main effects of self-affirmation for cognitive and behavioural outcomes.....</i>	<i>144</i>
Limitations of the current programme of research.....	147
<i>Reliance on self-report measures.....</i>	<i>147</i>
<i>Measures of Global self-esteem and Contingent self-esteem.....</i>	<i>149</i>
<i>Generalisability of research findings.....</i>	<i>150</i>
<i>Additional limitations.....</i>	<i>151</i>
Suggestions for future research.....	151
<i>The need for ongoing exploration into aspects of self-regard as moderators of self-affirmation effects .....</i>	<i>152</i>
<i>Exploring the effectiveness of different self-affirmation manipulations for individuals high in contingent self-esteem .....</i>	<i>153</i>
<i>The exploration of further moderators of self-affirmation effects .....</i>	<i>153</i>
<i>Exploring associations between variables using different analyses.....</i>	<i>154</i>
Conclusion .....	154
<b>References .....</b>	<b>156</b>
<b>Appendices .....</b>	<b>177</b>
Appendix 1 - Questionnaires referred to in Chapter 2 .....	178
Appendix 2 - Questionnaires referred to in Chapter 3 .....	211
Appendix 3 - Questionnaires referred to in Chapter 4 .....	236
Appendix 4 - Questionnaires referred to in Chapter 5 .....	256

### List of Figures

<b>Figure 1.</b>	Attitudes regressed onto condition for individuals with low, mean and high levels of self-esteem.....	49
<b>Figure 2.</b>	Intentions regressed onto condition for individuals with low, mean and high levels of self-esteem .....	50
<b>Figure 3.</b>	Message derogation regressed onto condition for individuals with low, mean and high levels of self-esteem .....	51
<b>Figure 4.</b>	Attitudes regressed onto condition for individuals with low, mean and high levels of contingent self-esteem . ....	77
<b>Figure 5.</b>	Perceived behavioural control regressed onto condition for individuals with low, mean and high levels of contingent self-esteem. ....	78
<b>Figure 6.</b>	Perceived behavioural control regressed onto condition for individuals with low, mean and high levels of global self-esteem.....	125
<b>Figure 7.</b>	Perceived behavioural control regressed onto condition for individuals with low, mean and high levels of contingent self-esteem.....	126
<b>Figure 8.</b>	Alcohol consumption at follow-up regressed onto condition for individuals with low, mean and high levels of global self-esteem.....	129

## List of Tables

<b>Table 1.</b>	Summary of Hierarchical Multiple Regression Analyses Predicting Indicators of Openness to the Health-Risk Message .....	53
<b>Table 2.</b>	Summary of Hierarchical Multiple Regression Analysis Predicting Exercise Behaviour at Follow-up.....	55
<b>Table 3.</b>	Descriptive statistics for baseline level of exercise behaviour and all self-regard scores .....	73
<b>Table 4 (Part 1).</b>	Summary of Hierarchical Multiple Regression Analyses Predicting Indicators of Openness to the Health-Risk information .....	74
<b>Table 4 (Part 2).</b>	Summary of Hierarchical Multiple Regression Analyses Predicting Indicators of Openness to the Health-Risk information .....	75
<b>Table 5</b>	Summary of Hierarchical Multiple Regression Analysis Predicting Exercise Behaviour at Follow-up.....	80
<b>Table 6.</b>	Estimated marginal means and standard deviations scores for cognitive indicators of openness to the health-risk message.....	100
<b>Table 7.</b>	Summary of ANOVAs predicting cognitive indicators of openness to the health-risk message.....	103
<b>Table 8 (Part 1).</b>	Summary of Hierarchical Multiple Regression Analyses Predicting Indicators of Openness to the Health-Risk information.....	121
<b>Table 8 (Part 2).</b>	Summary of Hierarchical Multiple Regression Analyses Predicting Indicators of Openness to the Health-Risk information.....	122
<b>Table 9.</b>	Summary of Hierarchical Multiple Regression Analysis Predicting Alcohol Consumption at Follow-up.....	127

## **Chapter 1: An Introductory Overview**

### **Overview**

The current research programme was designed to explore whether different aspects of self-regard would moderate the effectiveness of self-affirmation at promoting open processing of personally relevant health-risk information. The present chapter provides an overview of the relevant literature relating to the research domains explored in the thesis. Thus, this chapter first presents a summary of the theoretical assertions underpinning self-affirmation theory (SAT) and outlines frequently utilised self-affirmation manipulations. The chapter subsequently provides a brief summary of the general application of SAT within social psychology, before moving on to discuss applications of SAT as a technique to promote open processing of personally relevant health-risk information. Next, research that has explored potential moderators of the effectiveness of self-affirmation at promoting open processing of personally relevant health-risk information is considered. Particular attention is directed towards previous research exploring self-esteem as a moderator of self-affirmation effects. Given that the current research programme focuses on the moderating role of different aspects of self-regard, the literature review next describes the different aspects under investigation alongside global self-esteem: contingent self-esteem, self-esteem instability, implicit self-esteem, self-concept clarity and narcissism. As the results presented in this thesis highlight the moderating role of global self-esteem and contingent self-esteem on self-affirmation effects, these self-esteem variables are discussed in particular detail. The literature review subsequently outlines the health behaviours under investigation in this thesis – exercise and alcohol consumption - and discusses the importance of these behaviours for health outcomes. Finally, an overview of the research findings presented in the thesis is presented.

## **Self-affirmation theory (SAT)**

### ***Theoretical assertions of SAT***

Central to SAT (Steele, 1988) is the assertion that individuals are continually motivated to uphold a sense of global self-integrity, described by Steele as feeling “adaptively and morally adequate, that is, competent, good, coherent, unitary, stable, capable of free choice, capable of controlling important outcomes...” (p. 262). Motivations to uphold this positive view of the self become apparent when this view is under threat (Sherman & Cohen, 2006). Specifically, previous research has demonstrated that exposure to negative information about the self often results in defensive responses (e.g., Reed & Aspinwall, 1998). Whilst such responses may be effective in terms of reducing the threat to self-integrity, they may also result in the individual being less able to process potentially important information.

Encouragingly, however, SAT offers a technique that can help individuals to respond more adaptively to self-integrity threats. Specifically, SAT asserts that ‘the self-system is flexible’ (Sherman & Cohen, 2006, p.118), which implies that the need for global self-integrity could be satisfied by affirming any domain that is deemed important by the individual (Aronson, Cohen & Nail, 1999). Consequently, the self-integrity threat caused by negative information about the self could be countered by allowing individuals to reflect on any aspects of themselves they feel good about. In this way, global self-integrity remains intact, despite the presence of the self-threatening information, which reduces the need for the individual to process the threatening information in a defensive manner (Sherman & Cohen, 2006).

### ***Self-affirmation manipulations***

The aim of a self-affirmation manipulation is to afford an individual with an extensive view of the self through the process of reflecting on positive self-resources (Cohen & Sherman, 2014). This could be achieved in various ways; however, the essential component is that the individual is reminded of his/her adequacy, which should result in an affirmation of his/her overall sense of global self-integrity (Cohen & Sherman, 2014; Steele, 1988). In real life one could be self-affirmed through various means, such as receiving a good exam mark or participating in a local volunteer group (Cohen & Sherman, 2014). Within experimental research, however, the most frequently used self-affirmation manipulation is the value-based affirmation manipulation (Cohen & Sherman, 2014; McQueen & Klein, 2006). Participants completing value-based affirmation manipulations are typically asked to choose their most important value from a list of values, such as altruism or loyalty, and write about why this value is important to them. Another frequently used self-affirmation manipulation is the kindness affirmation manipulation (Armitage, Harris, Hepton & Napper, 2008; Reed & Aspinwall, 1998), which encourages participants to reflect on previous acts of kindness they have committed in the past. An example question from this task is “have you ever put another person’s interest before your own?”. Critically, all self-affirmation manipulations are believed to exert their effects through motivating the individual to take a broader perspective to the given situation and focus on what really matters to them (Cohen & Sherman, 2014).

### **Applications of SAT**

The capacity for self-affirmation to reduce defensive responses to self-threatening information was first demonstrated by studies exploring dissonance-reducing attitude

change in a conventional forced-compliance paradigm (e.g., Steele, Spencer & Lynch, 1993). In such studies, participants who wrote an essay on a counter-attitudinal topic of personal importance typically experienced increased cognitive dissonance, resulting in them engaging in dissonance-reducing attitude change. Critically, however, this tendency was found to be attenuated by self-affirmation; individuals who had been self-affirmed reported less dissonance-reducing attitude change compared to their non-affirmed counterparts.

Since then, SAT has been extensively applied to a range of different research domains. For example, as a result of self-affirmation, participants have been found to report decreased distancing strategies in close relationships (Jaremka, Bunyan, Collins & Sherman, 2011), reduced risk of self-control failure (Schmeichel & Vohs, 2009) and decreased self-handicapping tendencies (Siegel, Scillitoe & Parks-Yancy, 2005). Furthermore, research has also explored the potential for self-affirmation manipulations to reduce social identity threat and stereotype threat (Cohen, Garcia, Apfel & Master, 2006; Cohen, Garcia, Purdie-Vaughns, Apfel & Brzustoski, 2009; Sherman, Hartson, Binning, Purdie-Vaughns, Garcia, Taborsky-Barba, Tomassetti et al, 2013; Sherman & Kim, 2005).

Of particular relevance to the current research programme is the research documenting the capacity for self-affirmation to promote open processing of personally relevant health-risk information.

### **Application of SAT to personally relevant health-risk information**

SAT predicts that there is a tendency for individuals to respond defensively to information that contradicts the view of the self as a competent person, as such information would pose a threat to their feelings of global self-integrity (Steele, 1988).

As most people want to view themselves as healthy, being informed that one is engaging in a behaviour that put one's own health at risk is likely to cause a threat to global self-integrity (Cohen & Sherman, 2014). Indeed, considering issues relating to ill health poses a great threat to feelings of adequacy (Cohen & Sherman, 2014; Greenberg, Solomon, Pyszczynski, 1997). There is much research evidence suggesting that individuals often process personally relevant health-risk information defensively (Good & Abraham, 2007). For example, when exposed to a personally relevant and threatening health-risk message, individuals have been found to respond by denying personal susceptibility and risk (Brown & Smith, 2007; Stuteville, 1970), becoming more critical of the threatening message (Liberman & Chaiken, 1992), rating the message as less accurate (Croyle, Sun & Louise, 1993) and taking less time to read the message (Brown & Locker, 2009). Such defensive responses can potentially limit the efficacy of health promotion campaigns. Indeed, research has frequently reported that individuals who are at greatest risk of engaging in health-detrimental behaviours, i.e., those whom the health promotion campaigns are targeting, are the ones who are most likely to respond defensively to personally relevant health-risk information (Block & Williams, 2006; Good & Abraham, 2007; Keller, 1999; Sherman, Nelson & Steele, 2000; van Riet & Ruiter, 2011).

Encouragingly, however, SAT further suggest that if individuals are self-affirmed prior to being exposed to such information, they should be more able to process the personally relevant health-risk information more openly, without resorting to defensive responses. There is much research evidence to support this (Harris & Epton, 2009; 2010; Harris, 2011).



***The capacity of self-affirmation to promote positive changes in cognitive outcomes***

A plethora of published studies supports the contention that self-affirmation can increase open processing of personally relevant health-risk information, as evidenced by self-affirmed individuals reporting more positive evaluations and greater acceptance of personally relevant health-risk messages. Specifically, in regard to the capacity of self-affirmation to influence evaluation of personally relevant health-risk messages, studies have reported that self-affirmation can lead to more positive perceptions of message quality (van Koningsbruggen, Das & Roskos-Ewoldsen, 2009), higher ratings of how convincing the message is (Reed & Aspinwall, 1998), reduced levels of derogation of the message (Jessop, Simmonds & Sparks, 2009) and less critical evaluations of the message (Sherman, Nelson & Steele, 2000).

Furthermore, other studies have assessed the capacity of self-affirmation to promote open processing of personally relevant health-risk information by exploring individuals' acceptance of the content of such a message. Specifically, given that the majority of such messages focus on influencing individuals to either take up or desist from a particular health-related behaviour, this has frequently been operationalised in terms of cognitive indicators of openness to the health-risk information, including attitudes, intentions and perceptions of behavioural control. Indeed, there is much support that self-affirmed individuals report more positive attitudes and intentions, as well as greater perceptions of behavioural control, in relation to changing their behaviour accordingly with the recommendation outlined in the personally relevant health-risk message (e.g., Armitage, et al., 2008; Cooke, Trebaczyk, Harris & Wright, 2014; Harris, Mayle, Mabbott & Napper, 2007). As expressed by Harris and Epton (2009), given the central role of intentions in changing behaviours, the exploration of intentions and predictors of intentions have been key in understanding the effects of

self-affirmation on health behaviour change. As the studies exploring the capacity of self-affirmation to increase open processing of personally relevant health-risk information have recently been reviewed in detail by Harris and Epton (2009; 2010) and Harris (2011), this chapter will only provide an overview of research in this area.

One of the first studies to explore the application of self-affirmation to health-related behaviors focused on increasing unbiased processing of a health-risk message outlining a link between caffeine consumption and breast cancer risk (Reed & Aspinwall, 1998). This study found that self-affirmed participants who were frequent caffeine consumers rated the health-risk information as more convincing and reported greater perceptions of behavioural control in relation to decreasing caffeine consumption, compared to their non-affirmed counterparts. Similarly, Sherman, Nelson & Steele (2000) found that self-affirmed, frequent caffeine consumers reported greater acceptance and less criticism of a message detailing a link between caffeine consumption and breast cancer risk, together with more positive intentions to reduce their caffeine consumption, compared to their non-affirmed counterparts. Furthermore, Klein, Harris, Ferrer & Zajac (2011, study 2) demonstrated that after exposure to message outlining a link between caffeine consumption and breast cancer risk, self-affirmed frequent caffeine consumers reported increased levels of vulnerability to breast cancer and more positive intentions to reduce their caffeine intake, compared to their non-affirmed counterparts. However, this effect was only apparent when they were exposed to a strong, rather than a weak, health-risk message.

Another health-related domain where the ability of self-affirmation to promote open processing of personally relevant health-risk information has been demonstrated is smoking. Thus, Harris et al. (2007) reported that self-affirmed smokers rated graphic on-pack cigarette warning labels as more threatening and personally relevant, compared

to individuals in the control condition. Moreover, self-affirmed smokers reported more negative thoughts and feelings, greater levels of perceived behavioural control, more positive intentions and higher self-efficacy in relation to reducing their smoking behaviour, compared to non-affirmed participants. The motivation to reduce smoking behaviour for self-affirmed smokers was still apparent in a one-week follow-up, suggesting durable effects of self-affirmation on cognitions related to healthy behaviour change. In a similar vein, Armitage et al. (2008) reported that self-affirmed participants reported increased acceptance of a health-risk information describing the risks of smoking and more positive intentions towards reducing the number of cigarettes smoked, compared to participants in the control condition.

In the behavioural domain of alcohol consumption, Harris and Napper (2005) demonstrated that self-affirmed participants reported more fear arousal, higher risk perceptions and more positive intentions to reduce their alcohol intake after exposure to a message detailing the link between alcohol consumption and breast cancer risk, compared to non-affirmed participants. Interestingly, the self-affirmation was most effective at promoting openness of the health-risk message amongst participants who were defined as heavy drinkers. Similarly, Armitage, Harris and Arden (2011) demonstrated that self-affirmed participants reported higher levels of message processing and perceived threat, as well as lower derogation of a message detailing the risk of alcohol consumption, relative to those in the control condition.

There is also evidence that self-affirmation manipulations have the capacity to promote open processing of personally relevant health-risk information regarding the risks of insufficient physical activity. Jessop, Sparks, Buckland, Churchill and Harris (2014, Study 1) reported that self-affirmation lead to more positive attitudes, greater levels of response-efficacy and marginally greater perceptions of behavioural control

towards increasing exercise levels, relative to those in the control condition. Similarly, Cooke et al. (2014) found that self-affirmed individuals expressed more positive attitudes and intentions towards increasing their physical activity, compared to non-affirmed participants.

### ***Inconsistencies in findings relating to cognitive outcomes***

Whilst a mounting body of evidence attests to the success of self-affirmation manipulations at producing positive changes in various cognitive outcomes relating to behaviour change, it is notable that the predicted effects are not always apparent for all cognitive outcome variables. For example, Reed and Aspinwall (1998) found that self-affirmed participants reported lower intentions to reduce caffeine consumption. Furthermore, Harris and Napper (2005) found no impact of the self-affirmation manipulation on perceptions of behavioural control towards reducing alcohol consumption (Harris & Epton, 2009) and Armitage et al. (2008) found no effect of self-affirmation on self-efficacy regarding reducing smoking. The inconsistencies alluded to above may potentially limit the usefulness of self-affirmation as a health promotion technique (Harris & Epton, 2009) and highlight the importance of the ongoing investigation into the capacity of self-affirmation manipulations to result in more open processing of personally relevant health-risk information.

### ***The capacity of self-affirmation to promote positive behavioural outcomes***

In terms of health behaviour change, there is sufficient research evidence to support the notion that self-affirmation has the capacity to lead to immediate behavioural changes. For example, Sherman et al. (2000, study 2) demonstrated that a self-affirmation manipulation not only increased HIV risk perceptions amongst participants, but also

resulted in more HIV preventative behaviours, insofar as self-affirmed individuals were more likely to purchase condoms and take leaflets about HIV. Furthermore, Armitage et al. (2008) found that self-affirmed, at-risk individuals were more likely to take a leaflet with information on how to quit smoking. Similarly, Jessop, Simmonds and Sparks (2009) reported that participants in the positive traits affirmation condition were more likely to take a free sunscreen sample, compared to those in the control condition.

Encouragingly, there is also some research evidence suggesting that self-affirmation manipulations can promote longer-term behavioural changes. Epton and Harris (2008) demonstrated that self-affirmation significantly increased participants' self-reported fruit and vegetable consumption in a 7-day follow-up. Similarly, Armitage et al. (2011) found that self-affirmed participants reported significantly less alcohol consumption compared to non-affirmed participants, in the week following the intervention. Furthermore, two empirical studies have found support for the capacity of self-affirmation to increase exercise behaviour at follow-up. Specifically, Jessop et al. (2014, Study 1) and Cooke et al. (2014) both found that self-affirmed individuals reporting to have exercised more in the week following the intervention, relative to individuals in the control condition.

It is noteworthy, however, that several studies have failed to report any effects of a self-affirmation manipulation on behavioural outcomes, despite reporting positive effects for cognitive outcomes. For example, Reed and Aspinwall, (1998) found no evidence that self-affirmation was associated with participants reporting decreased caffeine consumption. Similarly, Harris et al. (2007) reported no impact of self-affirmation on self-reported reduction in number of cigarettes smoked at one-week follow-up. Indeed, there is a need for further research to explore the parameters that may influence when positive changes in cognitions arising as a result of self-affirmation

are more or less likely to lead to changes in subsequent health behaviour. However, as expressed by Harris and Epton (2009), the lack of translation from intentions to behaviour is not a problem that is unique to the self-affirmation literature (see Sheeran, 2002).

### **Moderators of the capacity for self-affirmation to promote open processing of health-risk information**

#### *The moderating role of individual level of risk*

Research exploring the capacity of self-affirmation to promote open processing of health-risk information has frequently assumed that self-affirmation effects are uniform (McQueen & Klein, 2006). However, a noteworthy exception to this is research that has explored individual level of risk as potential moderator of self-affirmation effects. Individual level of risk has typically been operationalised as the extent to which an individual is engaging in the specific health-risk behaviour under investigation at baseline.

Research findings have demonstrated that self-affirmation frequently has the most pronounced effects on individuals who are at highest risk. For example, Harris and Napper (2005) found that the effectiveness of a self-affirmation manipulation at promoting open processing of alcohol-related risk information was most apparent amongst participants who were defined as heavy drinkers. Similarly, Armitage et al. (2008) found that the effectiveness of a self-affirmation manipulation at facilitating open processing of health-risk information regarding the risks of smoking was most pronounced for the heaviest smokers in the sample. Furthermore, van Koningsbruggen and Das (2009) found that the capacity for self-affirmation to promote openness to

threatening information regarding type 2 diabetes was most apparent amongst those at greatest risk of developing diabetes. Indeed, as it is crucial that health promotion campaigns are able to reach those who are in greatest need of intervention, these findings are encouraging.

### ***The moderating role of aspects of self-regard***

Research to date has not systematically explored the role of potential dispositional moderators of the effectiveness of self-affirmation at promoting open processing of personally relevant health-risk information. It seems plausible that self-affirmation manipulations may not produce consistent results across different types of individuals (Harris & Epton, 2010). One set of dispositional variables that may be of particular relevance to explore as moderators of self-affirmation effects in health-related domains are variables related to self-regard (Harris & Epton, 2010). Specifically, one such key aspect is global self-esteem.

### ***The moderating impact of global self-esteem on self-affirmation effects***

Global self-esteem has been an extremely popular construct for decades, both within social psychology research and in the popular media (Heppner & Kernis, 2011). Due to the massive interest in the construct, many different definitions of self-esteem have emerged. However, the conceptualisation of self-esteem as a global evaluation or attitude relating to one's self-worth, formulated by Rosenberg (1965), has been the most frequently adopted definition.

The majority of research exploring the link between global self-esteem and health-related outcomes has suggested that individuals with low global self-esteem have a greater tendency to engage in health-detrimental behaviours (McGee & Williams,

2000; Stinson, Logel, Zanna, Holmes, Cameron, Wood, & Spencer, 2008). However, it is notable that these findings are by no means clear cut, as some research has also reported a link between high global self-esteem and increased likelihood to engage in health-damaging behaviours (e.g., Gerrard, Gibbons, Reis-Bergan & Russell, 2000). Moreover, there have been mixed findings regarding the relationship between global self-esteem and defensive responses to threatening information about the self. Whilst previous research has documented that individuals with low global self-esteem are more likely to react defensively when exposed to self-threatening information (e.g., Holland, Meertens & Van Vugt, 2002), other findings suggest the opposite pattern of results, with individuals high in global self-esteem responding more defensively when exposed to information that compromises their self-worth (e.g., Baumeister, Smart & Boden, 1996; Boney-McCoy, Gibbons & Gerrard, 1999).

Global self-esteem has long been regarded as central to SAT and has frequently been considered a possible contender as a mediator of self-affirmation effects. However, such research has produced inconclusive findings (McQueen & Klein, 2006; Sherman & Kim, 2005; Steele & Liu, 1983), with the majority of studies reporting no mediating role of global self-esteem on the effectiveness of self-affirmation at reducing defensive processing (e.g., Armitage & Rowe, 2011; Koole, Smeets, van Knippenberg & Dijksterhuis, 1999, study 3). By contrast, less research has explored the *moderating* impact of global self-esteem on self-affirmation effects.

Whilst some prior research has explored whether variables related to global self-esteem might moderate the effectiveness of self-affirmation at reducing defensive processing (e.g., Creswell, Welch, Taylor, Sherman and Gruenewald, 2005; Pietersma & Dijkstra, 2012; Steele et al., 1993), only one published study to date has directly examined whether global self-esteem moderated the impact of a self-affirmation



manipulation at promoting open processing of self-threatening information. In this study, Spencer, Fein & Lomore (2001) found that global self-esteem moderated the effectiveness of self-affirmation at promoting more open processing of personally threatening information regarding test performance. Specifically, it was demonstrated that self-affirmation resulted in less defensive responses for individuals with low global self-esteem. By contrast, there was no effect of the self-affirmation manipulation for individuals with high global self-esteem. Interestingly, self-affirmation resulted in the test performance estimates of those with low global self-esteem being brought in line with those given by their high global self-esteem counterparts. The findings of this study thus suggests that self-affirmation has the capacity to even out any disparities between low and high global self-esteem individuals, in terms of defensive responses to potentially threatening information.

It has been postulated that one potential explanation why self-affirmation manipulation might have more apparent effects for individuals with low global self-esteem could relate to the availability of positive resources (e.g., Pietersma & Dijkstra, 2012; Sherman & Cohen, 2006). Arguably, individuals with more positive self-resources available (e.g., those with high global self-esteem) may be less reliant on a self-affirmation manipulation in order to boost their self-integrity. By contrast, individuals with low global self-esteem - who may not have the same range of positive resources available to ameliorate feelings of threatened self-worth - may require an external manipulation in order to boost their self-integrity. Whilst this would seem consistent with the findings reported by Spencer et al. (2001), it is notable that Creswell et al. (2005) found that individuals with a positive self-concept (which included high levels of global self-esteem) benefited the most from a self-affirmation manipulation

aimed at reducing stress, compared to self-affirmed individuals with a negative self-concept.

It would seem to be worthwhile to continue to explore global self-esteem as a potential moderator of self-affirmation effects. In particular, at the time the programme of research presented in this thesis was started, no published studies had explored the potential moderating impact of global self-esteem on the capacity of self-affirmation at promoting open processing of personally relevant health-risk information. As pointed out in a review by Harris & Epton (2010), this seems to be a notable omission to the research in this field.

Traditionally, global self-esteem has been viewed as a one-dimensional concept, with an individual being characterised as lower or higher in global self-esteem. However, this simplistic view of self-esteem as only existing along one axis has now been challenged. Indeed, significant progress in understanding how self-esteem affects individuals was made when self-esteem was conceptualised as a heterogeneous construct (Heppner & Kernis, 2011). To the best of the author's knowledge, only one study has directly investigated whether specific aspects of self-esteem would moderate self-affirmation effects. Specifically, this study explored whether possessing defensive self-esteem (high defensive self-esteem is characterised by low implicit and high global self-esteem) would moderate the effectiveness of self-affirmation at reducing discrepancy between participants' current and ideal self-views (Haddock & Gebauer, 2011). Results revealed that individuals who were high in defensive self-esteem benefited more from the self-affirmation manipulation in terms of reporting lower actual-ideal self-discrepancy scores, compared to their non-affirmed counterparts. By contrast, there was no benefit of self-affirmation for individuals low in defensive self-

esteem. The findings of this study suggest that it may be useful to explore whether other specific aspects of self-esteem and self-regard would moderate self-affirmation effects.

The current research programme explored the following aspects as potential moderators of self-affirmation effects: global self-esteem, contingent self-esteem, self-esteem instability, implicit self-esteem, self-concept clarity and narcissism. It is noteworthy that, whilst self-concept clarity and narcissism are not strictly conceptualised as aspects of self-esteem, they were nonetheless included as potential moderators of self-affirmation effects.

Indeed, while exploration of the self-concept used to be predominately focused on self-esteem, the contemporary view of the self-construct is more complex and incorporates more aspects of self-relevant information (Campbell, Trapnell, Heine, Katz, Lavalley & Lehrman, 1996).

### **Aspects of self-regard under investigation in the thesis**

For the purposes of the current thesis, the term self-regard is used as a broad definition to refer to the way in which individuals perceive themselves. The decision was made to use the term self-regard as a pragmatic alternative to self-esteem, as self-esteem does not include the constructs of narcissism and self-concept clarity. Therefore, according to the definition of self-regard as it is used in this thesis, aspects of self-esteem will be subsumed under aspects of self-regard.

### ***Contingent self-esteem***

Whilst global self-esteem is defined as an overall evaluation of self-worth (Rosenberg, 1965), contingent self-esteem is concerned with the extent to which self-worth fluctuates as a result of external outcomes, such as gaining social approval or achieving

performance goals (Zeigler-Hill, Besser & King, 2011). Research into contingent self-esteem was instigated by the mixed findings regarding the benefits of possessing high levels of global self-esteem, which led researchers to explore other dimensions of self-esteem (Heppner & Kernis, 2011). In particular, it was suggested that it would be useful to differentiate between fragile or secure high self-esteem (Kernis, 2003). Whilst secure high self-esteem is characterised by a stable sense of self-worth that is largely unaffected by external threats, fragile high self-esteem requires validation and must be boosted to remain high (Heppner & Kernis, 2011; Zeigler-Hill, Besser & King, 2011). Indeed, it has been suggested that the most important marker of fragile self-esteem is self-esteem contingency (Heppner & Kernis, 2011).

Furthermore, high levels of contingent self-esteem have been linked to a variety of negative health outcomes. For example, it has been reported that individuals with high contingent self-esteem are more likely to drink more alcohol and to be influenced by external pressure to consume alcohol (Neighbors, Larimer, Markman Geisner & Knee, 2004). Furthermore, being preoccupied with gaining approval from other people, as often is the case for individuals high in contingent self-esteem (Heppner & Kernis, 2011), has been linked to various health-detrimental behaviours such as smoking (Camp, Klesges, & Relyea, 1993), sunbathing (Leary & Jones, 1993) and engaging in unsafe sex (Abraham, Sheeran, Spears, & Abrams, 1992). Moreover, research findings have also suggested that individuals with high contingent self-esteem stand a greater risk of developing eating disorders (Crocker, 2002). Collectively, such findings suggest that individuals with high levels of contingent self-esteem are at greater risk of engaging in behaviours that put their health at risk.

### ***Self-esteem instability***

Self-esteem instability is concerned with the small changes in self-esteem that occur during short time intervals (Heppner & Kernis, 2011). Specifically, it is the scale of these fluctuations that defines whether self-esteem is instable. High levels of self-esteem instability have been linked to negative effects for well-being. For example, self-esteem instability has been linked to increased proneness to anger, hostility and depression (Kernis, Whisenhunt, Waschull, Greenier, Berry, Herlocker & Anderson, 1998). Moreover, high levels of instability of self-esteem have also been found to create more emotional reactivity, resulting in stronger reactions to both favourable and unfavourable feedback (Kernis, Cornell, Sun, Berry & Harlow, 1993).

### ***Implicit self-esteem***

Implicit self-esteem differs from the other aspects of self-esteem discussed previously, as it is not available for introspection. Specifically, implicit self-esteem is concerned with the automatic evaluations of the self that people make outside of conscious awareness (Ziegler-Hill, 2006). Research into what differentiates implicit self-esteem from explicit self-esteem have suggested that whilst explicit self-esteem is a part of a cognitive system, insofar as it is the result of self-relevant feedback and analysis, implicit self-esteem is a part of a an affective system, based on past experiences and emotions (Bosson, Brown, Zeigler-Hill & Swann, 2003; Ziegler-Hill, 2006).

### ***Self-concept clarity***

One integral part of the self-concept is believed to be self-concept clarity, referring to the extent to which an individual experiences the self as being clearly defined and unambiguous (Campbell et al., 1996). Self-concept clarity differs from self-esteem in

that it is not concerned with how an individual feels about the self, but rather with how clear his/her view of the self is (Bechtoldt, De Dreu, Nijstad, Zapf, 2010). Previous research has suggested that highly stable self-esteem is positively associated with high levels of self-concept clarity (Nezlek & Plesko, 2001). Furthermore, research findings suggest that there are negative effects of low self-concept clarity at a clinical level, insofar as it has been related to increased levels of neuroticism, anxiety and depression (Campbell et al. ,1996)

### ***Narcissism***

The final aspect of self-regard explored in this thesis is Narcissism. Narcissism is a subclinical personality variable, which is characterised by extreme self-absorption and demand for constant admiration from others (Ames, Rose & Anderson, 2006; DSM V, 2013). Individuals with narcissistic tendencies have trouble maintaining meaningful relationships, often caused by a lack of empathy and a willingness to exploit others in order to achieve personal goals (DSM V, 2013). Moreover, narcissism has been linked to having a view of the self as being superior to other people and that if this view is threatened, this often results in feelings of humiliation and rage (DSM V, 2013).

### **Exercise and Alcohol consumption**

The current research programme focuses on the effect of self-affirmation in the context of processing personally relevant health-risk information, relating to exercise (Chapters 2, 3 & 4) and alcohol consumption (Chapter 5). Diseases of lifestyle, such as cardiovascular disease, cancer and diabetes, are the main causes of morbidity and mortality across the world today, accounting for 60% of all deaths (WHO, 2013). In particular, the most prominent cause of death is cardiovascular disease, which annually

kills nearly ten million people worldwide (WHO website, 2013). The causes of such diseases are related to lifestyle choices and, critically, several of these diseases can be prevented by altering specific lifestyle risk factors (WHO, 2013). Two lifestyle behaviours that have been implicated as important contributing factors to the steep rise in such diseases of lifestyle are insufficient exercise behaviour and excessive alcohol consumption (Mokdad, 2004).

### ***Exercise***

Exercise has been associated with various benefits for physical and mental health. For example, regular exercise has been linked to significantly reducing the risk of cardiovascular disease (Myers et al., 2004), diabetes (Uusitupa et al., 2000) and cancer (Hirose, Hamajima, Takezaki, Miura, & Tajima, 2003). Moreover, previous research has suggested that exercise increases health-related quality of life amongst cancer patients (Blanchard et al., 2004). In addition, exercise has also been found to improve mental health, for example, by decreasing symptoms of depression and preventing the onset of depression (Penedo & Dahn, 2005). There is also a body of literature demonstrating that regular exercise can reduce the likelihood of developing age-related cognitive impairments (Eriksson et al., 2009; Kramer, Erickson & Colombe, 2006).

Previous research has suggested that lack of exercise is the cause of around 12% of mortality in developed countries (Kinmonth et al., 2008). However, despite such strong support for the benefits of regular physical activity, the majority of people living in developed countries still remain physically inactive (Dunn et al., 1999).

At the time data was first collected for this thesis, the government guidelines concerning physical activity suggested that individuals should aim to exercise for 30 minutes or more for at least 5 days of the week (Department of Health, 2009). Although

these guidelines have since been updated, it is still recognised that one potential way to meet these recommendations is to exercise for 30 minutes or more for at least 5 days of the week (Department of Health, 2011; NHS choices, 2013).

Given the focus of the health-related information on moderate exercise conducted in sessions of 30 minutes or more, the decision was made to assess this behaviour using specific items asking individuals to indicate on how many days they had exercised for 30 minutes or more in the last seven days and on how many days they exercise for 30 minutes or more in the average week. This seemed to be preferable to using validated measures of exercise, e.g., the Leisure Time Physical Activity Questionnaire (Godin & Shephard, 1985), as the latter measures episodes of any type and level of exercise and does not specifically focus on moderate exercise.

### *Alcohol*

Alcohol has been identified as a crucial factor in the development of over 60 different medical conditions (Room, Babour & Rehm, 2005). In particular, high levels of alcohol consumption have been associated with increased levels of cardiovascular disease (Corrao et al., 2000), cancer (Bagnardi et al., 2000) and liver disease (Becker et al., 1996). Moreover, alcohol consumption has also been associated with a risk of developing mental health problems (WHO, 2014). Excessive alcohol consumption not only poses a huge medical burden at an individual level, but also has serious implications on a national scale in terms of both financial and social costs (WHO, 2014).

Despite the apparent risks associated with high levels of alcohol consumption, individuals frequently consume in excess of the recommended guidelines (Department of Health, 2013). For example, in 2012 in England, over 55% of all males and 53% of



all females consumed more alcohol than the recommended amounts (Health & Social Care Information Center, 2014).

### **Choice of dependent measures**

The studies in the current research programme that focus on exercise behaviour (Chapters 2, 3 and 4) all measured the impact of the self-affirmation manipulation on the following core cognitive indicators of openness to the health-risk information: attitudes, intentions and perceptions of behavioural control. These variables were selected as previous literature and theorising suggests that they are key predictors of behaviour change (Ajzen, 2002; Godin & Kok, 1996). Furthermore, given previous research findings, which suggest that self-affirmation can reduce reactance to health messages, message derogation was also included as an outcome in these studies, as an indicator of reactance to the personally relevant health-risk information (Jessop, Simmonds & Sparks, 2009).

The study reported in Chapter 5 focused on alcohol consumption. In addition to exploring the key predictors of behaviour change included in the studies on exercise behaviour (attitudes, intentions and perceptions of behavioural control), the decision was made to include the following outcome variables: subjective norms, descriptive norms, moral norms, anticipated regret and identity, as previous literature has supported that they play an important role in influencing alcohol consumption (e.g., Conner, Warren, Close & Sparks, 1999; Cooke, Sniehotta & Schuz, 2007; Mcmillan & Conner, 2003).

### **Overview of the current research programme**

The aim of the current research programme was to explore the moderating role of different aspects of self-regard on the capacity of self-affirmation to promote open

processing of personally relevant health-risk information. The study presented in Chapter 2 explored the potential moderating impact of global self-esteem on the effectiveness of a values-based self-affirmation manipulation aimed at increasing open processing of a risk message detailing the dangers of taking insufficient exercise.

Building upon the findings of this study, the study reported in Chapter 3 explored whether the following aspects of self-regard would moderate the impact of self-affirmation on exposure to the same health-related message alongside global self-esteem: contingent self-esteem, self-esteem instability, implicit self-esteem, self-concept clarity and narcissism.

The experimental study presented in Chapter 4 investigated whether experimentally primed level of contingent self-esteem would moderate the effectiveness of a self-affirmation manipulation at promoting open processing of health-risk information detailing the risks of insufficient exercise.

The study reported in Chapter 5 developed the research further by exploring the potential moderating roles of global self-esteem and contingent self-esteem on the effectiveness of a kindness-based affirmation at promoting open processing of a health-risk message in a different behavioural domain: alcohol consumption.

Lastly, Chapter 6 summarises the research findings presented in this thesis, discusses their implications for practice and theoretical development, outlines some of the limitations to the research programme and highlight possible directions for future research.

As the design of the studies presented in Chapters 2, 3 and 4 overlapped in terms of both the self-affirmation manipulation used and the health-risk information presented, discrete recruitment techniques were employed to minimise the risk of the same

participant completing more than one study. For the study presented in Chapter 2, participants were recruited through contacting various departments of UK universities and through approaching contacts of the researcher. For the study presented in Chapter 3, staff and students at different university departments and contacts of the researcher who had not taken part in the study described in Chapter 2 were recruited. Participants in the study described in Chapter 4 were recruited through contacting local councils and utilising the participant database pool at the hosting university. In addition, further participants were recruited for this study by contacting staff and students at UK universities and contacts of the researcher who had not completed the studies presented in Chapters 2 or 3.

## Chapter 2: The Moderating Impact of Self-Esteem on Self-Affirmation Effects<sup>1</sup>

### Abstract

The present study explored whether self-esteem would moderate the effectiveness of a self-affirmation manipulation at increasing openness to personally relevant health-risk information. The study employed a prospective experimental design. Participants ( $N = 328$ ) completed either a self-affirmation manipulation or a control task, prior to reading information detailing the health-related consequences of taking insufficient exercise. They then completed a series of measures assessing their cognitions towards increasing their exercise behaviour and their derogation of the information. Exercise behaviour was assessed at one-week follow-up. Self-esteem moderated the impact of self-affirmation on the majority of outcomes. For participants with low self-esteem, the self-affirmation manipulation resulted in more positive attitudes and intentions towards increasing their exercise behaviour, together with lower levels of derogation of the health-risk information. By contrast there was no effect of the self-affirmation manipulation on outcomes for participants with high self-esteem. Findings suggest that self-affirmation manipulations might be of particular benefit for those with low self-esteem in terms of promoting openness towards health-risk information. This is promising from a health-promotion perspective, as individuals with low self-esteem often represent those most in need of intervention.

---

<sup>1</sup> The research reported in this chapter is in press: Düring, C. & Jessop, D. C. (2014). The moderating impact of self-esteem on self-affirmation effects. *British Journal of Health Psychology*, published online in March. doi:10.1111/bjhp.12097

<sup>2</sup> Due to an administrative error, only 9 of the original 10 items were included in the questionnaire

## **Introduction**

Diseases of lifestyle constitute the main causes of morbidity and mortality in the western world (Mokdad, Marks, Stroup & Gerberding, 2004; Smith, Orleans & Jenkins, 2004). This has led to an urgent need for health professionals to optimise the effectiveness of health promotion strategies. Current campaigns often highlight the risks of either engaging in unhealthy behaviours (e.g., smoking) or failing to engage in healthy behaviours (e.g., exercise). However, research findings suggest that the recipients of such campaigns may respond by derogating the message (Freeman, Hennessy & Marzullo, 2001) and frequently remain unpersuaded of the need to change (Keller, 1999; Liberman & Chaiken, 1992; van Riet & Ruiter, 2011; Sherman, Nelson & Steele, 2000). This tendency to respond defensively to personally relevant health-risk information comprises a salient threat to the efficacy of health promotion campaigns.

### ***Self-Affirmation Theory***

Self-affirmation theory (Steele, 1988) offers both a theoretical account of the reasons underpinning such defensive responses and a possible technique to overcome them. Self-affirmation theory asserts that individuals' thoughts and behaviours are motivated by a need to maintain a sense of global self-integrity (Steele, 1988). Steele describes global self-integrity as feeling 'adaptively and morally adequate, that is, competent, good, coherent, unitary, stable, capable of free choice, capable of controlling important outcomes...' (Steele, 1988, p. 262). Exposure to personally threatening health-risk information threatens this view of the self (why would a capable, sensible individual engage in health-damaging behaviour?), resulting in motivations to restore one's self-integrity. One way in which this can be achieved is through processing the threatening information in a biased and defensive manner. However, while this may restore self-

integrity, it is likely to also prevent the individual from openly processing the information that is being presented. This, in turn, may deter the individual from changing his/her maladaptive behaviour.

Critically, self-affirmation theory suggests a way in which the tendency to process personally relevant health-risk information defensively can be overcome. As already alluded to, a fundamental principle of self-affirmation theory is the idea that individuals are largely motivated to uphold their self-integrity. The theory further contends that the 'the self-system is flexible' (Sherman & Cohen, 2006, p.118) and hence that affirmation of an important self-related domain should result in individuals being less inclined to react defensively when faced with threatening information, as their overall sense of self-integrity should remain intact. Thus self-affirmed individuals should be able to process threatening information more openly without compromising their self-integrity.

A growing body of evidence supports the position that self-affirmed individuals process personally relevant health-risk information more openly than their non-affirmed counterparts. For example, self-affirmation manipulations have been found to result in greater intentions to reduce alcohol consumption (Harris & Napper, 2005), more positive intentions and perceptions of behavioural control regarding reducing the number of cigarettes smoked (Armitage, Harris, Hepton, & Napper, 2008; Harris, Mayle, Mabbott & Napper, 2007), higher levels of self- and response-efficacy in relation to increasing fruit and vegetable consumption (Epton & Harris, 2008) and more positive attitudes, intentions, self- and response-efficacy, together with reduced message derogation, in relation to sunscreen use (Jessop, Simmonds & Sparks, 2009).

It is noteworthy, however, that the predicted effects of self-affirmation on cognitive indicators of openness to health-risk information are not always apparent for

all outcome variables. For example, Armitage et al. (2008) reported no effect of self-affirmation on self-efficacy beliefs regarding giving up smoking; similarly, Harris & Napper (2005) found no effects of self-affirmation on attitudes or perceived behavioural control regarding reducing one's alcohol consumption (Harris & Epton, 2009).

Furthermore, evidence that self-affirmation manipulations promote sustained changes in behaviour has been less forthcoming (Harris & Napper, 2005; Harris et al., 2007; Reed & Aspinwall, 1998), with only a few studies documenting behaviour change over time (Armitage, Harris & Arden, 2011; Epton & Harris, 2008; see also Logel & Cohen, 2012).

To date, research has primarily focused on uniform effects of self-affirmation manipulations across participants. A notable exception to this is individual level of risk, which has been found to moderate self-affirmation effects, with those at higher risk typically showing greater benefits of self-affirmation in terms of its capacity to promote more open processing of health-related information (e.g., Harris & Napper, 2005; Harris et al., 2007; Armitage et al., 2008). Research has not, however, systematically explored the role of individual difference variables in moderating the effectiveness of self-affirmation manipulations in health-related contexts. As observed by Harris & Epton (2010), this would seem to be a notable omission to research in this area, since self-affirmation manipulations may influence certain types of individuals more than others. Therefore, they propose that self-affirmation research in health-related domains might benefit from considering potential dispositional moderators such as self-esteem. The current study goes some way towards addressing this gap in the literature by exploring the possible moderating role of self-esteem on the effectiveness of a self-affirmation manipulation at increasing openness to personally relevant health-risk information.

### ***Self-Affirmation Theory and Self-Esteem***

Self-esteem has long been explored as a potential mediator of self-affirmation effects, albeit with inconclusive support (Steele & Liu, 1983; Sherman & Kim, 2005; McQueen & Klein, 2006). By contrast, comparatively little research has directly tested the potential *moderating* role of self-esteem on self-affirmation effects (Creswell et al., 2005; Spencer, Fein & Lomore, 2001; van Dijk et al., 2011)

It has been suggested (e.g., Pietersma & Dijkstra, 2012; Sherman & Cohen, 2006) that individuals with low self-esteem might benefit more from self-affirmation when faced with threatening information, because they do not have ready access to the same range of positive self-feelings as individuals with high self-esteem. Thus, they may require an explicit self-affirmation manipulation to negate any threat to self-integrity posed by threatening information. By contrast, individuals with high self-esteem may possess an extensive repertoire of positive self-resources that they can readily access (independent of a self-affirmation manipulation) in order to restore self-integrity when faced with threatening information (cf. Dodgson & Wood, 1988; Spencer, Fein & Lomore, 2001; Steele, Spencer & Lynch, 1993).

Research findings outside the self-affirmation literature support the basic premise that individuals with high self-esteem might be better able to draw on positive self-resources when faced with threatening information. For example, Dodgson & Wood (1998) explored the impact of exposure to feedback about personal failure on thoughts about the self. For individuals with high self-esteem, they found that exposure to such negative feedback resulted in thoughts of personal strengths being significantly more accessible than thoughts of personal weaknesses. This effect was not found for individuals with low self-esteem, suggesting that these individuals do not automatically respond in the same compensatory way to threatening information about the self.



To the best of the authors' knowledge, only one published study has directly investigated whether self-esteem moderates the effectiveness of self-affirmation at reducing defensive responses to threatening information. Spencer et al. (2001) tested whether the effects of a self-affirmation manipulation on estimates of task performance were moderated by self-esteem. They demonstrated that self-affirmation resulted in decreased defensiveness for those with low self-esteem. By contrast, there was no effect of the self-affirmation manipulation for those with high self-esteem. Furthermore, the self-affirmation manipulation served to bring the task performance estimates of those with low self-esteem in line with those given by their high self-esteem counterparts. This suggests that self-affirmation may help even out any disparities between low and high self-esteem individuals, in terms of whether they respond defensively to potentially threatening information.

Critically, research has not explored whether self-esteem would similarly moderate the impact of self-affirmation on responses to threatening health-risk information. In light of the research described above, it seems plausible that any benefits of self-affirmation – in terms of its capacity to promote more open processing of such information – might be particularly apparent for those low in self-esteem. From an applied perspective, it would seem to be important to establish whether this is the case, not least because some evidence suggests that those with low self-esteem are more likely to engage in a variety of potentially harmful health-related behaviours (Stinson et al., 2008; but see also Gerrard, Gibbons, Reis-Bergan & Russell, 2000). Furthermore, the findings of some studies suggest that low self-esteem is associated with increased defensive processing of personally relevant health-risk information (e.g., Holland, Meertens & Van Vugt, 2002); however, research findings in this area are by no means clear cut, with other studies reporting high self-esteem to be linked with greater

defensiveness (e.g., Baumeister, Smart & Boden, 1996; Boney-McCoy, Gibbons & Gerrard, 1999).

### ***The Present Research***

The aim of the current study was to explore whether self-esteem would moderate the effectiveness of a self-affirmation manipulation aimed at reducing defensive processing of health-risk information detailing the dangers of engaging in insufficient exercise. Exercise was chosen as the target health behaviour, as physical inactivity constitutes a widespread problem that is contributing to the steep rise of several diseases of lifestyle (Department of Health, 2004; Kinmonth et al., 2009).

As discussed, individuals with low self-esteem may benefit more from a self-affirmation manipulation, as they possess fewer positive self-resources that they can readily access when faced with information that threatens self-integrity (Pietersma & Dijkstra, 2012; Sherman & Cohen, 2006; Spencer et al., 2001). It was thus hypothesised that self-affirmed individuals with low self-esteem would report more positive attitudes, intentions and perceived behavioural control regarding increasing their exercise behaviour, alongside reduced derogation of the health-risk information, compared to their non-affirmed counterparts. It was also predicted that self-affirmed individuals with low self-esteem would be more likely to increase their exercise behaviour at follow-up, compared to their non-affirmed counterparts. By contrast, it was predicted that any effects of the self-affirmation manipulation on these outcomes would be less strong, if indeed they were apparent at all, for those with high self-esteem.

## Method

### *Participants*

Four hundred and thirty-three participants completed the Time 1 questionnaire. Of these, 348 completed the Time 2 questionnaire and 312 completed the Time 3 questionnaire, representing an overall attrition rate of 27.95%. Participants who completed questionnaires up to and including those at Time 2 were included in the subsequent analyses. However, as the health risk information explicitly stated that people are advised to exercise for a minimum of 30 minutes on 5 or more days of the week (see below), participants who already met this exercise target ( $n = 19$ ) or who omitted to indicate their baseline average exercise behaviour ( $n = 1$ ) were excluded from the subsequent analysis as it was deemed unlikely that the health-risk information would be threatening to them. This left a sample of 328 participants, who had completed the measures at Time 1 and Time 2.

Ages ranged from 18-74 years ( $M = 27.61$ ,  $SD = 11.45$ ). The majority of the sample were female ( $n = 252$ ), students ( $n = 238$ ) and from the UK ( $n = 220$ ).

Preliminary analyses were conducted to explore whether responders and non-responders at times 2 and 3 differed in terms of self-esteem scores, baseline exercise behaviour, age or gender. One-way ANOVAs revealed no significant differences in terms of self-esteem or baseline exercise behaviour ( $ps > .24$ ). There were, however, significant differences in age at Times 2 and 3, with responders at both time points being significantly older than non-responders ( $ps < .01$ ). Chi-square analysis also revealed a marginally significant trend for women to be more likely to respond at Time 2 compared to men ( $p = .053$ ).

## ***Materials***

Participants completed a series of online questionnaires at three time points, each a week apart. Unless stated otherwise, materials were administered in the order described below.

**Time 1 questionnaire.** At time 1, participants completed a questionnaire including the following sections:

***Demographic information.*** Participants indicated their age, gender, nationality and current occupation.

***Self-esteem.*** Self-esteem was assessed using the Rosenberg Self-Esteem Scale (1965)<sup>2</sup>. Responses to all items were given on 4-point scales ranging from *Strongly Disagree* (1) to *Strongly Agree* (4). The scale was found to have an acceptable level of internal reliability,  $\alpha = .86$ , a mean score was calculated for each participant, with higher scores representing higher self-esteem.

**Time 2 Questionnaire.** At time 2, participants completed a questionnaire including the following sections:

***Baseline exercise behaviour.*** Participants were informed that, for the purpose of the current study, exercise was defined as, '*any moderate to vigorous physical activity, performed in your leisure time, that raises your heart rate, and results in you becoming warm and at least mildly out of breath*'. Following Jessop et al. (2014), they subsequently completed the following questions assessing their baseline exercise behaviour; 'In the past seven days on how many days have you exercised for 30 minutes or more?' and 'In the average week, on how many days do you exercise for 30 minutes or more?'. Responses to both questions were given on eight-point scales ranging from 0 to 7.

***Self-affirmation manipulation.*** Following Sherman et al. (2000, Study 2), participants in the self-affirmation condition chose their most important value from a list of 12 different values (e.g., loyalty) and wrote a short statement (2-3 sentences) about why this value was important to them. Participants in the control condition chose their least important value from the same list and wrote a short statement (2-3 sentences) about why this value might be important to someone else.

***Importance of selected value.*** Participants rated how important the value that they had chosen to write about was to them on a 7-point scale, ranging from *extremely unimportant* (1) to *extremely important* (7).

***Health message.*** Participants read four short paragraphs about exercise. The first paragraph emphasised that people who do not exercise sufficiently are at risk of developing many serious health problems (e.g., ‘If you don’t do enough exercise, compared to those who do, you are twice as likely to develop heart diseases and type 2 diabetes’). The second paragraph further highlighted these risks, (e.g., ‘being physically unfit is just as dangerous as smoking in terms of lowering life expectancy’). The third paragraph gave examples of possible exercise activities, and stressed that taking up exercise does not need to be expensive or time-consuming (e.g., ‘In reality, it is easy to increase the amount of exercise and many forms of exercise are free’). The last paragraph stated that the UK Government guidelines recommend that people exercise for ‘30 minutes or more on at least 5 days of the week’ and highlighted that the responsibility to change lay with the individual. All the information that was presented was factually correct and was based on information from the UK Department of Health website (Department of Health, 2004).

***Indicators of openness to the health-risk message.*** Participants next completed a number of items assessing each of the following indicators of openness to the health-

risk message. Responses to all items were given on 7-point scales with appropriate anchors (e.g. *strongly disagree* [1] to *strongly agree* [7]), unless otherwise indicated. As recommended by Azjen (2002), the items assessing attitudes, perceived behavioural control and intentions were intermixed.

**Attitudes.** Participants' attitudes were assessed by asking them to respond to the following statement, 'For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be ...': on five pairs of semantic differentials (*extremely bad* [1] to *extremely good* [7], *extremely harmful* [1] to *extremely beneficial* [7], *extremely unpleasant* [1] to *extremely pleasant* [7], *extremely unenjoyable* [1] to *extremely enjoyable* [7] and *extremely worthless* [1] to *extremely valuable* [7]). The scale was found to have an acceptable level of internal reliability,  $\alpha = .85$ . Mean scores were calculated for each participant with higher scores indicating more positive attitudes.

**Perceived behavioural control.** Perceived behavioural control was assessed by four items, e.g., 'If I wanted to I could increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days',  $\alpha = .85$ . A mean score was calculated for each participant with higher scores indicating greater perceived behavioural control.

**Intentions.** Intentions were assessed using three items, e.g., 'I intend to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days',  $\alpha = .95$ . A mean score was calculated for each participant with higher scores indicating more positive intentions.

**Message derogation.** Participants were asked whether the information presented in the health message was (i) overblown, (ii) exaggerated, (iii) tried to manipulate their feelings and (iv) tried to strain the truth. The scale was found to have an acceptable

level of internal reliability,  $\alpha = .82$ . A mean score was calculated for each participant with higher scores indicating greater levels of message derogation.

**Time 3 Questionnaire.** At time 3, participants completed a questionnaire including the following section:

***Behaviour at follow-up.*** Participants were reminded of the definition of exercise given at Time 2 and asked to respond to the same item used at Time 2 to assess their exercise behaviour over the past seven days.

### ***Design and Procedure***

This study adopted a prospective experimental design. Participants were allocated alternately to the self-affirmation condition ( $n = 175$ ) or the control condition ( $n = 173$ ). Data were collected in three waves, with one week between each data collection point. Participants were recruited opportunistically via an email message that was sent out to mailing lists of several UK universities and also to contacts of one of the researchers. The message contained information about the study alongside the web link to the Time 1 questionnaire. Recipients of the recruitment message were encouraged to pass this on to their contacts. Participants who provided their email addresses at Time 1 were contacted a week later via an email message containing the web link to the Time 2 questionnaire. Those participants who completed this questionnaire were again contacted by email one week later and sent the link to the Time 3 questionnaire. As an incentive to participate and in order to deter attrition, a cash prize draw of £100 was offered to participants who completed all three questionnaires. The study was approved by the University Life Science and Psychology Research Ethics Committee.

## Results

The number of times participants reported exercising in the past week ranged from 0-7 ( $M = 2.16$ ,  $SD = 1.63$ ) and the number of times they reported exercising in the average week ranged from 0-5 ( $M = 2.30$ ,  $SD = 1.57$ ). Participants' mean self-esteem scores ranged from 1.22-4.00 ( $M = 2.92$ ,  $SD = 0.53$ ).

One-way ANOVAs revealed no significant differences between conditions in terms of age, self-esteem, baseline exercise behaviour or average weekly exercise behaviour ( $ps > .24$ ). Chi-square analysis revealed no significant association between condition and gender ( $p = .24$ ).

As predicted, a one-way ANOVA revealed that participants in the self-affirmation condition rated the value they had elected to write about as significantly more important than did participants in the control condition,  $F(1, 326) = 687.92$ ,  $p = .001$ ,  $\eta p^2 = .68$ ,  $Ms = 6.35$  and  $2.64$  respectively.

### Indicators of Openness to the Health-Risk Message

A series of hierarchical multiple regression analyses was conducted to determine whether self-esteem moderated any impact of the self-affirmation manipulation on each of the following indicators of openness to the health-risk message: attitudes, intentions, perceived behavioural control and message derogation. For each analysis, condition (dummy coded; control = 0 and self-affirmation = 1) was entered as a predictor at step 1, mean-centred self-esteem scores were entered at step 2 and the interaction term between these variables was entered at step 3 (the resultant analyses are summarised in Table 1).

Where appropriate, the moderating effect of self-esteem was investigated further by conducting simple slopes analyses (Aiken & West, 1991). Specifically, the



dependent variable was regressed onto condition for those with low (1 *SD* below the mean), mean and high (1 *SD* above the mean) self-esteem scores.

**Attitudes.** Condition, entered at step 1, failed to significantly predict participants' attitude scores,  $F(1, 326) = .08, p = .78, R^2 = .001$ . Including self-esteem scores at step 2 significantly increased the variance in attitudes accounted for,  $\Delta F(1, 325) = 9.58, p = .002, \Delta R^2 = .03$ . Moreover, the inclusion of the two-way interaction term at step 3 significantly increased the variance in attitudes accounted for by the model,  $\Delta F(1, 324) = 5.58, p = .02, \Delta R^2 = .02$ , indicating that self-esteem moderated any association between self-affirmation and attitudes.

Simple slopes analysis (see Figure 1) revealed that for those with low self-esteem, there was a significant effect of condition on attitudes, with those in the self-affirmation condition reporting more positive attitudes compared to those in the control condition,  $\beta = .16, t(327) = 2.02, p = .04, d = .22$ . There was no effect of condition on the attitude scores of those with either mean self-esteem levels,  $\beta = .03, t(327) = .50, p = .62, d = .06$ , or high self-esteem levels,  $\beta = -.10, t(327) = -1.32, p = .19, d = -.06$ .

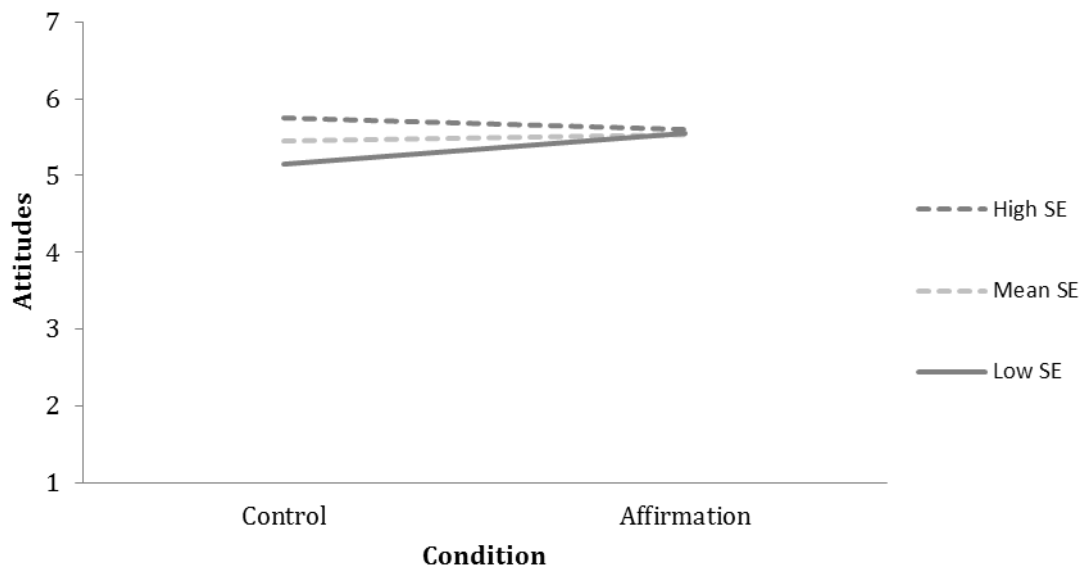


Figure 1. Attitudes regressed onto condition for individuals with low, mean and high levels of self-esteem (SE).

**Perceived Behavioural Control.** Condition, self-esteem and the two-way interaction term all failed to significantly predict perceived behavioural control.

**Intentions.** Condition, entered at step 1, marginally predicted participants' intentions,  $F(1, 326) = 3.70, p = .06, R^2 = .01$ , with those in the self-affirmation condition reporting higher intentions than those in the control condition,  $M_s = 4.91$  and  $4.59$  respectively. The inclusion of self-esteem entered at step 2, did not significantly increase the amount of variance explained by the model,  $\Delta F(1, 325) = 1.37, p = .24, \Delta R^2 = .00$ . Critically, however, the inclusion of the 2 way interaction term at step 3 significantly increased the variance in intentions accounted for,  $\Delta F(1, 324) = 3.96, p = .05, \Delta R^2 = .01$ , indicating that self-esteem moderated any association between self-affirmation and intentions.

Simple slopes analyses revealed there was a significant effect of condition on intentions for participants with low self-esteem,  $\beta = .22$ ,  $t(327) = 2.83$ ,  $p = .005$ ,  $d = .31$ , and mean self-esteem,  $\beta = .11$ ,  $t(327) = 2.01$ ,  $p = .05$ ,  $d = .22$  (see Figure 2). In both cases, individuals in the self-affirmation condition reported more positive intentions compared to those in the control condition. There was no effect of condition on intention scores for individuals with high self-esteem,  $\beta = .00$ ,  $t(327) = .010$ ,  $p = .99$ ,  $d = .001$ .

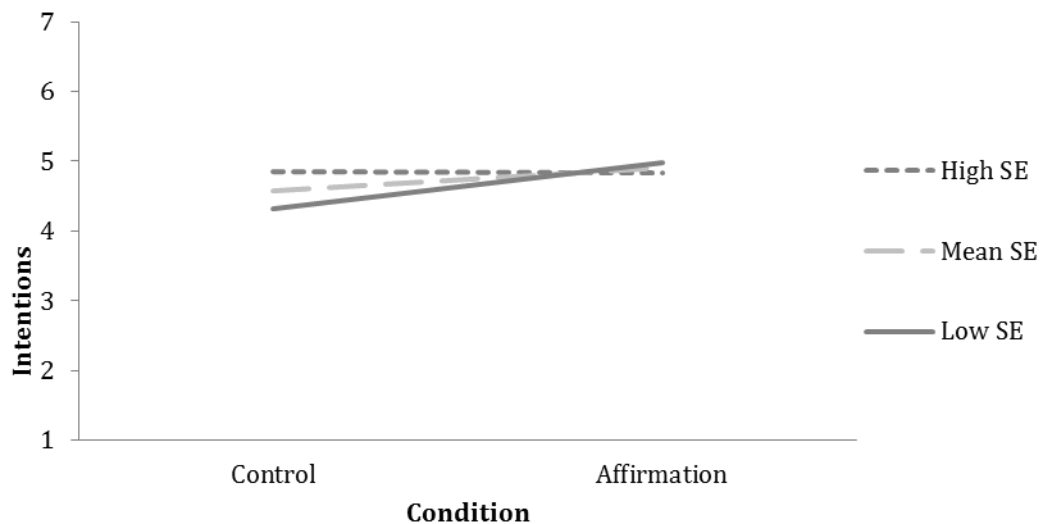
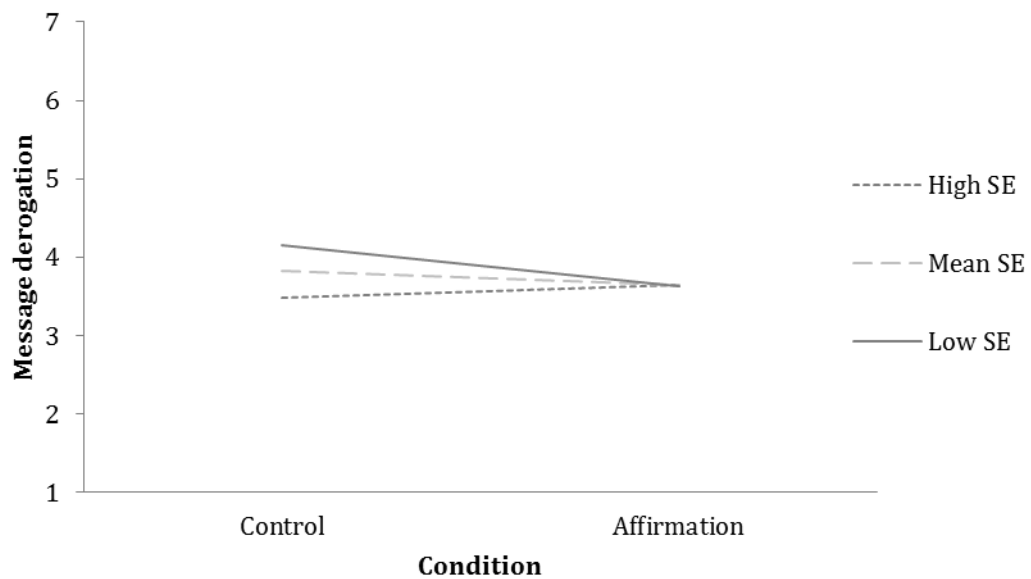


Figure 2. Intentions regressed onto condition for individuals with low, mean and high levels of self-esteem (SE).

**Message Derogation.** Condition, entered at step 1, failed to significantly predict participants' derogation of the message,  $F(1, 326) = .50$ ,  $p = .48$ ,  $R^2 = .002$  and the inclusion of self-esteem at step 2, did not significantly increase the amount of variance explained by the model,  $\Delta F(1, 325) = 3.46$ ,  $p = .06$ ,  $\Delta R^2 = .011$ . Critically, however, the inclusion of the interaction term at step 3 significantly increased the amount of variance

in message derogation accounted for by the model,  $\Delta F(1, 324) = 5.28, p = .02, \Delta R^2 = .02$ , indicating that self-esteem moderated any association between self-affirmation and message derogation.

Simple slopes analyses revealed that for those with low self-esteem there was a significant effect of condition on message derogation, with those in the self-affirmation condition reporting lower levels of message derogation compared to those in the control condition,  $\beta = -.17, t(327) = -2.22, p = .03, d = -.24$  (see Figure 3). There was no impact of condition on the message derogation scores of those with either mean levels of self-esteem,  $\beta = -.05, t(327) = -.84, p = .41, d = -.09$ , or high levels of self-esteem,  $\beta = .08, t(327) = 1.04, p = .30, d = .11$ .



*Figure 3.* Message derogation regressed onto condition for individuals with low, mean and high levels of self-esteem (SE).

Supplementary multiple regression analyses were conducted including gender as a predictor variable, together with the corresponding two- and three-way interaction terms. The results of these analyses revealed no evidence that gender moderated the

effects of condition and/or self-esteem on attitudes, perceived behavioural control or message derogation. When gender was included in the regression model predicting intentions, however, the resultant analysis revealed a significant three-way interaction between gender, self-esteem and condition. Follow-up analyses revealed that self-esteem only moderated the impact of the self-affirmation on intentions for male participants.

Table 1  
*Summary of Hierarchical Multiple Regression Analyses Predicting Indicators of Openness to the Health-Risk Message*

Variables entered	Attitudes			Perceived Behavioural Control			Intention			Message Derogation		
	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
Condition	.02	.03	.03	-.03	-.02	-.02	.11	.11	.11	-.04	-.05	-.05
Self-esteem		.17*	.30*		.08	.08		.07	.18		-.10	-.23
Condition X Self-esteem			.18*			.01			-.16*			.18*
R <sup>2</sup>	.00	.03	.05	.00	.01	.01	.01	.02	.03	.00	.01	.03
Model F	.080	4.83	5.13	.25	1.27	.85	3.70	2.54	3.03	.50	1.98	3.10
$\Delta R^2$		.03*	.02*		.01	.00		.00	.01*		.01	.02*
$\Delta F$		9.58*	5.58*		2.29	.01		1.37	3.96*		3.46	5.28*

\* $p < .05$ .

### **Predicting Behavioural Outcomes**

Hierarchical multiple regression analysis was carried out to determine the effect of the self-affirmation manipulation, self-esteem and the interaction between these two variables on exercise behaviour change. Number of times exercised in the past seven days at baseline was entered as a predictor at step 1, condition (dummy coded; control = 0 and self-affirmation = 1) was entered as a predictor at step 2, mean-centred self-esteem scores were entered at step 3 and the interaction term between condition and self-esteem was entered at step 4. The number of times exercised in the past seven days at follow-up was entered as the dependent variable. Baseline exercise behaviour significantly contributed to the prediction of participants' exercise behaviour at follow-up,  $F(1, 289) = 181.75, p < .001, R^2 = .38$ . However, the inclusion of condition, self-esteem and the two-way interaction term did not significantly increase the amount of variance explained by the model, ( $\Delta R^2$ s  $< .01, ps > .51$ ).

Table 2.

*Summary of Hierarchical Multiple Regression Analysis Predicting Exercise Behaviour at Follow-up*

Variables entered	Exercise behaviour at follow-up			
	$\beta$	$\beta$	$\beta$	$\beta$
	Step 1	Step 2	Step 3	Step 4
Baseline exercise behaviour	.62***	.62***	.62***	.62***
Condition		-.03	-.03	-.03
Global self-esteem			.02	-.01
Condition X Global self-esteem				.05
$R^2$	.39	.39	.39	.39
Model F	181.75***	90.89***	60.49***	45.39***
$\Delta R^2$		.00	.00	.00
$\Delta F$		.52	.66	.51

\*\*\* $p < .001$



## **Discussion**

Findings support the hypothesis that self-esteem would moderate the impact of a self-affirmation manipulation on responses to personally relevant health-risk information. As predicted, for those with low self-esteem, the self-affirmation manipulation resulted in more positive attitudes and intentions towards increasing their exercise behaviour, together with less derogation of the health-risk information. For those with high self-esteem there was no effect of the self-affirmation manipulation on these outcome variables.

While this pattern of findings was not apparent for perceived behavioural control, it is not unusual for self-affirmation research to find predicted effects for some but not all outcome variables, even when well-established moderators such as individual level of risk are taken into account (Harris & Epton, 2009). Furthermore, the current study found no impact of the self-affirmation manipulation on exercise behaviour at follow-up, irrespective of level of self-esteem. Again, this is not inconsistent with prior self-affirmation research, which has on occasion failed to demonstrate any impact of self-affirmation on behaviour at follow up (Harris & Napper, 2009).

The results of the current study largely support the contention that individuals with low self-esteem would benefit most from a self-affirmation manipulation (Pietersma & Dijkstra, 2012; Sherman & Cohen, 2006). As described in the introduction section, one possible explanation for this relates to the availability of positive thoughts about the self. Individuals with high self-esteem might have ready access to a wide range of positive self-feelings when faced with threatening information (Dodgson & Wood, 1998; Pietersma & Dijkstra, 2012; Sherman & Cohen, 2006; Steele et al., 1993). As such, an explicit self-affirmation manipulation might confer little

advantage to these individuals, in terms of allowing them to process the information more openly. By contrast, individuals with low self-esteem might have a more limited array of positive self-feelings readily available to them when faced with threatening information. Accordingly, an explicit self-affirmation manipulation might provide an important means of boosting self-integrity for these individuals in such situations, with the result that they are better able to process threatening information more openly (see also Spencer et al., 2001).

Indeed, it is notable that the self-affirmation manipulation appeared to result in low self-esteem individuals reporting equivalent levels of attitude, intention and message derogation to those with high self-esteem. This suggests that self-affirmation might serve to “level the playing field” between those low and high in self-esteem in terms of their capacity to process personally relevant health-risk information openly. This finding echoes that of Spencer et al. (2001), who similarly showed that self-affirmation reduced the levels of defensiveness displayed by those low in self-esteem so that they were in line with those reported by participants high in self-esteem.

Interestingly, subsidiary regression analysis including gender revealed that the significant interaction between self-esteem and condition on behavioural intentions only held for male participants. As far as the authors are aware, this is the first study to demonstrate a differential effect of self-affirmation and self-esteem on outcomes as a function of gender. However, given that this effect was only apparent for one out of the four outcome variables, it should be interpreted with a certain degree of caution.

As described in the introduction, some research findings have suggested that people low in self-esteem are more likely to engage in health detrimental behaviours (Stinson et al., 2008, but see also Gerrard et al., 2000) and may be more likely to respond defensively to health-risk information (Holland et al., 2002, but see also Boney-

McCoy et al., 1999). Therefore, individuals low in self-esteem may represent those most in need of intervention. Accordingly, the finding that self-affirmation is particularly effective at promoting open processing of health-risk information for individuals low in self-esteem is very encouraging from a health promotion perspective and suggests that self-affirmation manipulations might provide an effective means of reaching this group of individuals.

At a broader level, the findings of the current research demonstrate the importance of taking into account individual difference variables such as self-esteem when exploring the impact of self-affirmation manipulations on outcomes. It is noteworthy that the present study found a marginally significant main effect of self-affirmation on only one of the outcomes under investigation: behavioural intentions. If the current study had not taken into account the potential moderating impact of self-esteem, it would have wrongly concluded that the self-affirmation manipulation had no significant effect on any of the outcome variables. It is possible that other analyses of (perhaps unpublished) datasets have mistakenly concluded that self-affirmation has had no impact on outcomes, as they have omitted to explore the role of key dispositional moderators. Indeed the current study found no effects of the self-affirmation manipulation for individuals high in self-esteem. Previous self-affirmation studies have frequently utilised samples of university students (e.g., Harris et al., 2007), who, considering the positive correlation between high self-esteem and academic success, are presumably relatively high in self-esteem (Baumesiter, Campbell, Krueger & Vohs, 2003). While such studies have found main effects of self-affirmation on outcomes, it is plausible that their findings might underestimate the potential impact of self-affirmation among samples with more heterogeneous levels of self-esteem.

In particular, the findings of the current study suggest that research should continue to explore self-esteem as a moderator of self-affirmation effects in health-related contexts. It is widely accepted that self-esteem is a multi-dimensional construct (Heppner & Kernis, 2011). As such, it would be interesting for future research to explore whether specific dimensions of self-esteem represent particularly salient moderators of self-affirmation effects. Potential candidates of interest for future studies to explore include contingent self-esteem (Kernis & Goldman, 2006), self-esteem stability (Chabrol, Rousseau & Callahan, 2006) and defensive self-esteem (Haddock & Gebauer, 2011).

One limitation to the current research is the reliance of self-report measures of exercise behaviour. While evidence supports the validity of self-report measures of exercise (e.g., Miller, Freedson & Kline, 1994), future research would benefit from replicating the current study using an objective measure of behaviour. A second limitation concerns the over-representation of students in the current sample and the differential attrition by age; future research should ideally utilise stratified samples of the general public. A third limitation to the present study is that participants were allocated to condition alternately. While preliminary analyses revealed no differences between conditions on socio-demographic variables or baseline behaviour, future research should employ methods of random allocation. It would also be of interest for future research to explore whether any impact of the self-affirmation manipulation and self-esteem on cognitions remained consistent over time and whether the reported findings hold across behavioural domains.

In summary, the present study is the first to document self-esteem as a significant moderator of self-affirmation effects in a health-related context. Specifically, the results revealed that self-affirmation was most effective at promoting open

processing of personally relevant health-risk information for those with low self-esteem. Indeed, there was no evidence that the self-affirmation manipulation had any impact on message processing for individuals with high self-esteem. These findings highlight the importance of considering such dispositional variables as moderators of self-affirmation effects.

### **Chapter 3: Self-regard and self-affirmation: evidence that contingent self-esteem moderates self-affirmation effects**

#### **Abstract**

The current study explored the potential moderating role of different aspects of self-regard on the effectiveness of a self-affirmation manipulation at promoting open processing of threatening information. At baseline, participants completed measures of the following aspects of self-regard: global self-esteem, contingent self-esteem, self-esteem instability, implicit self-esteem, self-concept clarity and narcissism. At Time 1, participants ( $N = 166$ ) completed either a self-affirmation task or control equivalent prior to reading information detailing the risks of taking insufficient exercise. They subsequently completed a series of measures assessing cognitive indicators of openness to the threatening information. Participants' exercise behaviour was assessed at one-week follow-up. Results revealed that contingent self-esteem moderated the impact of the self-affirmation manipulation on attitudes and perceptions of behavioural control. Specifically, the self-affirmation manipulation promoted positive attitudes and greater perceptions of control amongst those low in contingent self-esteem. By contrast, there was no evidence that self-affirmation promoted openness to the health-risk information for individuals with high contingent self-esteem. Findings thus suggest that the capacity for self-affirmation to promote open processing of threatening information may be particularly evident for individuals with low levels of contingent self-esteem.

## Introduction

### *Self-affirmation theory*

Self-affirmation theory (Steele, 1988) contends that people are strongly motivated to maintain a sense of global self-integrity, where the latter has been described as having an image of oneself as being “adaptively and morally adequate, that is, competent, good, coherent, unitary, stable, capable of free choice, capable of controlling important outcomes...” (1988, p. 262). In order to uphold self-integrity, individuals may process information that contradicts this positive view of the self in a defensive manner. Whilst this may be effective in terms of restoring global self-integrity, it can also result in the individual ignoring potentially important information.

Critically, Steele (1988) suggests that the tendency to respond defensively to threatening information about the self can be diminished by boosting global self-integrity. This can be achieved by providing individuals with the chance to self-affirm, by reflecting on positive sources of self-integrity. Such self-affirmations should result in an overall sense of self-worth being restored and the individual should be able to process negative information about the self more openly without engaging in defensive processing.

### *Evidence of the effectiveness of self-affirmation theory*

Research findings support the notion that self-affirmation manipulations have the capacity to reduce defensive reactions to personally relevant and threatening information across a range of domains. For example, compared to their non-affirmed counterparts, self-affirmed participants report less prejudice (Fein & Spencer, 1997) and

reduced tendency to engage in downward social comparisons (Spencer, Fein & Lomore, 2001) after exposure to self-threatening information.

Of particular relevance to the present study is the body of literature suggesting that self-affirmation can result in less defensive processing of personally relevant health-risk information. For example, studies have demonstrated that self-affirmed participants report more positive attitudes, intentions, self- and response-efficacy, as well as reduced message derogation, in relation to sunscreen use (Jessop, Simmonds & Sparks, 2009), more positive intentions towards reducing alcohol consumption (Harris & Napper, 2005) and more positive intentions and perceptions of behavioural control in terms of reducing number of cigarettes smoked (Armitage, Harris, Hepton, & Napper, 2008; Harris, Mayle, Mabbott & Napper, 2007), compared to their non-affirmed counterparts. Moreover, in the health-domain of exercise behaviour, it has been demonstrated that self-affirmed individuals report more positive attitudes and intentions towards increasing their exercise behaviour, relative to their non-affirmed counterparts (Cooke, Trebaczyk, Harris & Wright, 2014). Similarly, Jessop, Sparks, Buckland, Churchill and Harris (2014, Study 1) found that self-affirmed participants report more positive attitudes, greater levels of response-efficacy and marginally greater perceptions of behavioural control towards increasing physical activity, compared to those in the control condition.

Despite the apparent success of self-affirmation manipulations at positively influencing cognitive indicators of openness to health-risk information, it is noteworthy that the predicted effects are not always found across all outcome variables (e.g., Armitage et al, 2008; Harris & Epton, 2009).

A growing body of research also supports the ability of self-affirmation manipulations to promote health behaviour change (Armitage, Harris & Arden, 2011;



Cooke et al., 2014; Epton & Harris, 2008; Jessop et al., 2014, Study 1). However several studies have failed to report effects of self-affirmation on behaviour (e.g. Harris & Napper, 2005; Harris et al., 2007; Reed & Aspinwall, 1998).

### ***Moderators of self-affirmation effects***

One variable that has received considerable attention as a moderator of self-affirmation effects in health-related domains is level of risk, where the latter is typically operationalised as an individual's baseline level of engagement with the health behaviour under investigation. Encouragingly, from a health promotion perspective, self-affirmation manipulations appear to be most effective at promoting openness to health-risk information amongst those at greatest risk (Armitage et al., 2008; Harris & Napper, 2005; Harris et al., 2007).

### ***Self-esteem as a potential moderator self-affirmation research***

To date, dispositional variables have received little attention as potential moderators of self-affirmation effects. As self-affirmation manipulations may potentially be more effective for certain types of individuals, this is an area that merits further investigation (Harris & Epton, 2010). It has been suggested that variables relating to self-regard may be of particular relevance to explore when considering dispositional moderators of self-affirmation effects (Harris & Epton, 2010). One such key variable is self-esteem.

Two studies to date have directly explored whether global self-esteem would moderate the effectiveness of a self-affirmation manipulation at promoting open processing of personally relevant threatening information. Spencer, Fein and Lomore (2001) demonstrated that a self-affirmation manipulation resulted in participants with low global self-esteem (who typically self-deprecate) reporting more positive estimates

of their performance on an intelligence test. Similarly, the findings reported in Study 1 of the current programme of research demonstrated that a self-affirmation manipulation promoted open processing of information detailing the risks of insufficient exercise for individuals with low global self-esteem. Specifically, self-affirmed participants with low global self-esteem reported more positive attitudes and intentions towards increasing their exercise behaviour, as well as less derogation of the health-risk information, compared to their non-affirmed counterparts. Interestingly, in both studies, there was no effect of the self-affirmation manipulation for those with high global self-esteem. Collectively, the findings from these studies indicate that global self-esteem may be an important moderator of self-affirmation effects. Specifically, the results suggest that the ability of self-affirmation to promote open processing of threatening information might be most apparent for those with low levels of global self-esteem.

Critically, however, both studies focused on global self-esteem as a moderator of self-affirmation effects. It is broadly accepted that self-esteem is a multi-dimensional construct (Kernis, Lakey & Heppner, 2008). Specific aspects of self-esteem that have been put forward include contingent self-esteem, self-esteem instability and implicit self-esteem. Contingent self-esteem captures the extent to which an individual bases their self-esteem on external outcomes, such as attaining particular achievement goals or social approval (Heppner & Kernis, 2011; Zeigler-Hill, Besser & King, 2011). Having high levels of contingent self-esteem has been linked to a higher risk of engaging in behaviours that are harmful to one's health. For example, individuals with high contingent self-esteem stand a greater risk of developing eating disorders (Crocker, 2002) and succumbing to external pressures to consume alcohol (Neighbours, Larimer, Markman, Geisner & Knee, 2004). Self-esteem instability refers to the extent that an individual's level of self-esteem fluctuates across relatively brief time intervals

(Heppner & Kernis, 2011; Kernis, 2005). Previous research has demonstrated that highly unstable self-esteem has been linked to increased levels of anger, hostility, depression and emotional reactivity (Kernis, Cornell, Sun, Berry & Harlow, 1993; Kernis, Whisenhunt, Waschull, Berry, Herlocker & Anderson, 1998). *Implicit self-esteem* encapsulates the non-conscious automatic evaluations people make about themselves (Heppner & Kernis, 2011; Pelham et al., 2005). Specifically, implicit self-esteem refers to the affective associations that one has of the self that are learnt over time and not based on deliberate and rational information processing (Bosson, Brown, Zeigler-Hill & Swann, 2003). Some research has suggested that implicit self-esteem is a better predictor than explicit self-esteem when it comes to an individual's spontaneous and emotional reactions (Greenwald & Farnham, 2000).

Further key aspects of self-regard include self-concept clarity and narcissism. Self-concept clarity reflects the extent to which an individual experiences the self as being clearly defined and unambiguous (Campbell, Trapnell, Heine, Katz, Lavalley & Lehrman 1996). Specifically, rather than describing how an individual feels about themselves, self-concept clarity is concerned with how clear their view of the self is (Bechtoldt, De Dreu, Nijstad & Zapf, 2010). Low levels of self-concept clarity has been linked by previous research to a higher risk of developing depression and anxiety (Campbell et al., 1996). Narcissism is a subclinical individual difference variable concerned with self-admiration that is characterised by inflated ideas about one's own importance and lack of empathy for others (Ames, Rose & Anderson, 2006; DSM V, 2013). Narcissistic individuals often report a lack of empathy for other people and have been found to respond to self-threatening information with heightened levels of humiliation and rage (DSM V, 2013).

To the best of the author's knowledge, only one published study has directly investigated whether specific aspects of self-esteem moderate self-affirmation effects. Haddock & Gebauer (2011) found that a self-affirmation manipulation only benefitted those individuals who were high in defensive self-esteem (characterised by low implicit and high global self-esteem), insofar as it lowered the discrepancy between current and ideal selves. This finding thus suggests that specific aspects of self-esteem might be important moderators of the effects of a self-affirmation on outcomes; however, this would seem to be an area that merits further investigation.

### ***The present paper***

In light of the above, the aim of this study was to extend previous research by exploring the potential role of a number of aspects of self-regard as moderators of self-affirmation effects. Specifically, the current research investigated whether the effectiveness of a self-affirmation manipulation at promoting openness to health-risk information would be moderated by each of the following aspects of self-regard alongside global self-esteem: contingent self-esteem, self-esteem instability, implicit self-esteem, self-concept clarity and narcissism. The decision was made to focus on exercise as the target behaviour, as insufficient exercise represents a serious health problem that is contributing to the steep increase in diseases of lifestyle in the western world (Kinmonth et al., 2009).

## **Method**

### ***Participants***

Two hundred and forty-one participants completed baseline measures of self-regard and the Time 1 questionnaire, which included the self-affirmation manipulation. "High

exercisers”, defined as those exercising 4 or more times in the average week ( $n = 75$ ), were excluded from the subsequent analyses, as it was hypothesised that they would not be threatened by the health-risk information (see Jessop et al., 2014). The final sample thus comprised 166 participants. The majority were female (68.07%), students (84.34%) and British nationals, (70.91%). Ages ranged from 18 to 55 years ( $M = 23.44$ ,  $SD = 8.06$ ).

One hundred and forty-five participants completed measures at Time 2, representing a 12.65% attrition rate. One-way ANOVAs found no significant differences between responders and non-responders at Time 2 in terms of any the self-regard aspects under investigation, number of times exercised in the past week at Time 1, average weekly exercise behaviour or age ( $ps > .22$ ). Chi-square analyses revealed no significant association between responding at Time 2 and either gender or condition ( $ps > .39$ ).

### ***Materials***

Participants completed a series of online questionnaires. Unless stated otherwise, materials were administered in the order described below.

#### **Baseline measures of self-regard.**

At baseline, participants completed a questionnaire including the following sections:

***Demographic information.*** Participants were asked to indicate their age, gender, nationality and current occupation.

***Aspects of self-regard.*** Global self-esteem was assessed using the 10-item *Rosenberg Self-Esteem Scale* (1965); Contingent self-esteem was assessed using the 15-

item *Contingent Self-Esteem* Scale (Kernis & Goldman, 2006); Self-Esteem Instability was assessed using the 4-item *Self-Esteem Instability* Scale (Chabrol, Rousseau, & Callahan, 2006); Implicit self-esteem was assessed using the single-item *Name Liking Task* (Gebauer, Riketta, Broemer, & Maio, 2008); Self-Concept Clarity was measured using the 12-item *Self-Concept Clarity* Scale (Campbell et al, 1996); and Narcissism was assessed using the 16-item *Narcissistic Personality Inventory* (Ames, Rose & Anderson, 2006). For multi-item scales, internal reliabilities were found to be acceptable, all  $\alpha s > .73$ , and mean scores were calculated for each participant, with higher scores representing higher levels of the specific aspect of self-regard in question.

**Time 1 questionnaire.** At Time 1, participants completed a questionnaire including the following sections:

***Exercise behaviour.*** Participants were informed that, for the purpose of the current study, exercise was defined as, ‘*any moderate to vigorous physical activity, performed in your leisure time, that raises your heart rate, and results in you becoming warm and at least mildly out of breath*’. Following Jessop et al. (2014), they subsequently completed the following questions assessing their exercise behaviour; ‘In the past seven days on how many days have you exercised for 30 minutes or more?’ and ‘In the average week, on how many days do you exercise for 30 minutes or more?’. Responses to both questions were given on eight-point scales ranging from 0 to 7.

***Self-affirmation manipulation.*** Following Sherman et al. (2000, Study 2), participants in the self-affirmation condition selected their most important value from a list of 12 different values (e.g., altruism) and were asked to write a short statement (2-3 sentences) on why their chosen value was important to them. Participants in the control condition were presented with values from the same list and but were instead asked to

choose their least important value and to write a short statement (2-3 sentences) about why this value might be important to someone else.

***Importance of selected value.*** All participants were asked to rate how important the value that they had chosen to write about was to them on a 7 point scale, ranging from *extremely unimportant* (1) to *extremely important* (7).

***Health-risk information.*** Following Study 1, participants were presented with four short paragraphs about exercise. The first paragraph emphasised that people who do not exercise sufficiently are at risk of developing many serious health problems (e.g., If you do not do enough exercise you are twice as likely to develop heart disease and type 2 diabetes). The second paragraph further highlighted these risks, (e.g., being physically unfit is just as dangerous as smoking in terms of lowering life expectancy). The third paragraph emphasised the feasibility and relative ease of increasing the amount exercise taken (e.g., In reality, it is easy to increase the amount of exercise and many forms of exercise are free). The last paragraph described that Government guidelines recommend that people exercise for “30 minutes or more on at least 5 days of the week” and highlighted that the responsibility to change lay with the individual. All the information that was presented was factually correct and based on information from the UK Department of Health website (Department of Health, 2011).

***Indicators of openness to the health-risk information.*** Participants completed items assessing the following cognitive indicators of openness to the health-risk information. Responses to all items were given on 7-point scales with appropriate anchors (e.g. *strongly disagree* [1] to *strongly agree* [7]), unless otherwise indicated. All scales were found to have acceptable levels of internal reliability,  $\alpha s > .81$ , and mean scores were calculated for each participant. As recommended by Azjen (2002),

the items assessing attitudes, perceived behavioural control and intentions were intermixed.

**Attitudes.** Participants' attitudes towards increasing the amount they exercised were assessed by asking them to respond to the following statement, "For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be..." on five pairs of semantic differentials (e.g., *extremely bad* [1] to *extremely good* [7]).

**Perceived behavioural control.** Perceived behavioural control was assessed by four items, e.g., "If I wanted to I could increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days".

**Intentions.** Intentions were assessed using three items, e.g., "I intend to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days".

**Message derogation.** Message derogation was assessed using four items, e.g., "I thought the information presented in the health message was overblown".

**Time 2 questionnaire.** At Time 2, participants completed a questionnaire including the following section:

**Exercise behaviour at follow-up.** Participants were reminded of the definition of exercise given at Time 1 and asked to respond to the same item used at Time 1 to assess their exercise behaviour over the past seven days.

### ***Design and Procedure***

This study adopted a prospective experimental design. Participants were alternately allocated to either the self-affirmation condition ( $n = 83$ ) or the control condition ( $n =$



83). Data was collected in three waves, with one week between each data collection point. Participants were recruited via emails, which contained the web link to the baseline questionnaire. The recruitment message was initially sent out to the mailing lists of a number of UK universities. A snowballing recruitment technique was employed, whereby recipients of the recruitment emails were asked to pass on the recruitment message to their contacts. A week after completing the baseline questionnaire, participants were contacted via e-mail with the link to the Time 1 questionnaire. The Time 2 questionnaire was similarly sent to participants one week after completion of Time 1 questionnaire. In order to deter attrition, a cash prize draw of £100 was offered to participants who had completed all three questionnaires. The study received approval from the Life Science and Psychology Research Ethics Committee of the hosting university.

## **Results**

### **Preliminary analyses**

Participants' scores on the various aspects of self-regard and baseline levels of exercise are summarised in Table 2.

A series of one-way ANOVAs revealed no significant differences between participants in the control condition and the self-affirmation condition in terms of any of the self-regard aspects, age, the number of times exercised in the average week or the number of times exercised in the past seven days ( $ps > .13$ ). However, chi-square analysis revealed a marginally significant association between condition and gender, with a higher ratio of women to men in the control condition,  $\chi^2(1, N = 166) = 5.09, p = .08$ , Cramer's  $V = .18$ .

As expected, participants in the self-affirmation condition rated the value they had elected to write about as significantly more important to them than participants in

the control condition,  $F(1, 164) = 203.39$ ,  $p < .001$ ,  $\eta p^2 = .56$ ,  $Ms = 6.23$  and  $3.00$  respectively.

Table 3.

*Descriptive statistics for baseline levels of exercise behaviour and self-regard aspects*

	<i>M</i>	<i>SD</i>	Min	Max
Global self-esteem	2.95	0.45	1.40	4.00
Contingent self-esteem	3.54	0.63	1.67	4.93
Self-esteem instability	2.68	0.63	1.00	4.00
Implicit self-esteem	6.77	1.97	1.00	9.00
Self-concept clarity	3.11	0.75	1.42	4.83
Narcissism	1.30	0.20	1.00	1.94
Past 7 days exercise behaviour	1.39	1.36	0.00	5.00
Average weekly exercise behaviour	1.48	1.13	0.00	3.00

### **Cognitive indicators of openness to the health-risk information**

In order to determine whether any impact of the self-affirmation manipulation on the cognitive indicators of openness to the health-risk information was moderated by global self-esteem, contingent self-esteem, self-esteem instability, implicit self-esteem, self-concept clarity and/or narcissism, a series of hierarchical multiple regression analyses was conducted. For each analysis, condition (dummy coded; control = 0, self-affirmation = 1) was entered as a predictor at step 1, mean-centred scores for each self-regard aspect were entered at step 2 and the two-way interaction terms between condition and each aspect of self-regard were entered at step 3. The resultant analyses are summarised in Table 3. Where appropriate, the moderating effect of self-regard was investigated further by conducting simple slopes analyses (Aiken & West, 1991). Specifically, the dependent variable was regressed onto condition for those with low (1 *SD* below the mean), mean and high (1 *SD* above the mean) self-regard scores.

Table 4 (Part 1)

*Summary of Hierarchical Multiple Regression Analyses Predicting Indicators of Openness to the Health-Risk information*

Variables entered	Attitudes			PBC		
	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
Condition	.02	.01	.01	.18*	.16*	.16*
Global self-esteem (GSE)		.01	.02		.32**	.41*
Contingent self-esteem (CSE)		.16	-.37*		-.09	.11
Self-esteem instability (SEI)		-.20*	-.13		-.01	-.09
Implicit self-esteem (ISE)		-.01	-.07		.01	.02
Self-concept clarity (SCC)		.07	.10		-.20	-.14
Narcissism (Nar)		-.04	.07		-.08	-.14
Condition X GSE			.06			-.13
Condition X CSE			-.31*			-.30*
Condition X SEI			-.01			.12
Condition X ISE			.13			.17
Condition X SCC			-.04			-.14
Condition X Nar			-.12			.14
R <sup>2</sup>	.01	.06	.13	.03	.11	.15
Model F	.08	1.55	1.70	5.16*	2.85**	1.98*
$\Delta R^2$	.01	.06	.06	.03	.08	.03
$\Delta F$	.08	1.80	1.82	5.16*	2.42*	.97

\* $p < .05$ , \*\* $p < .01$ .

Table 4 (Part 2)  
*Summary of Hierarchical Multiple Regression Analyses Predicting Indicators of Openness to the Health-Risk information*

Variables entered	Intentions			Message derogation		
	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
Condition	.01	-.01	.00	.06	.08	.08
Global self-esteem (GSE)		.19	.04		-.02	-.06
Contingent self-esteem (CSE)		.02	.09		.08	.06
Self-esteem instability (SEI)		-.03	-.04		.13	-.07
Implicit self-esteem (ISE)		-.06	.01		-.04	.11
Self-concept clarity (SCC)		-.06	-.09		.06	-.07
Narcissism (Nar)		.01	.13		.09	-.05
Condition X GSE			.16			.04
Condition X CSE			-.10			.05
Condition X SEI			-.01			-.01
Condition X ISE			-.06			.16
Condition X SCC			.05			-.20
Condition X Nar			-.17			.20
$R^2$	.01*	.03	.06	.01	.03	.08
Model F	.01	.67	.72	.61	.74	.96
$\Delta R^2$	.01	.03	.03	.01	.03	.04
$\Delta F$	.01	.78	.78	.61	.77	1.22

\* $p < .05$ , \*\* $p < .01$ .

**Attitude.** Condition, entered at step 1, did not significantly predict participants' attitude scores,  $F(1, 164) = 0.08, p = .78, R^2 = .01$ , and the inclusion of the self-regard aspects at step 2 did not significantly increase the amount of variance accounted for by the model,  $\Delta F(6, 158) = 1.80, p = .10, \Delta R^2 = .06$ . While the inclusion of the two-way interaction terms at step 3 did not significantly increase the overall variance in attitudes accounted for by the model,  $\Delta F(6, 152) = 1.82, p = .10, \Delta R^2 = .06$ , the interaction term between condition and contingent self-esteem emerged as a significant linear predictor,  $\beta = -.31, t(165) = -2.22, p = .03, d = .35$ .

Simple slopes analysis (Figure 4) revealed that for those with low contingent self-esteem, there was a significant effect of condition on attitude, with participants in the self-affirmation condition reporting more positive attitudes than their counterparts in the control condition,  $\beta = .25, t(165) = 2.31, p = .02, d = .36$ . There was no effect of condition on the attitude scores of those with mean levels of contingent self-esteem,  $\beta = .001, t(165) = .05, p = .96, d = .01$ . However, there was a marginally significant effect of condition on attitudes for those with high contingent self-esteem,  $\beta = -.20, t(165) = -1.86, p = .06, d = -.29$ , reflecting the fact that self-affirmed participants reported marginally less positive attitudes than their counterparts in the control condition.

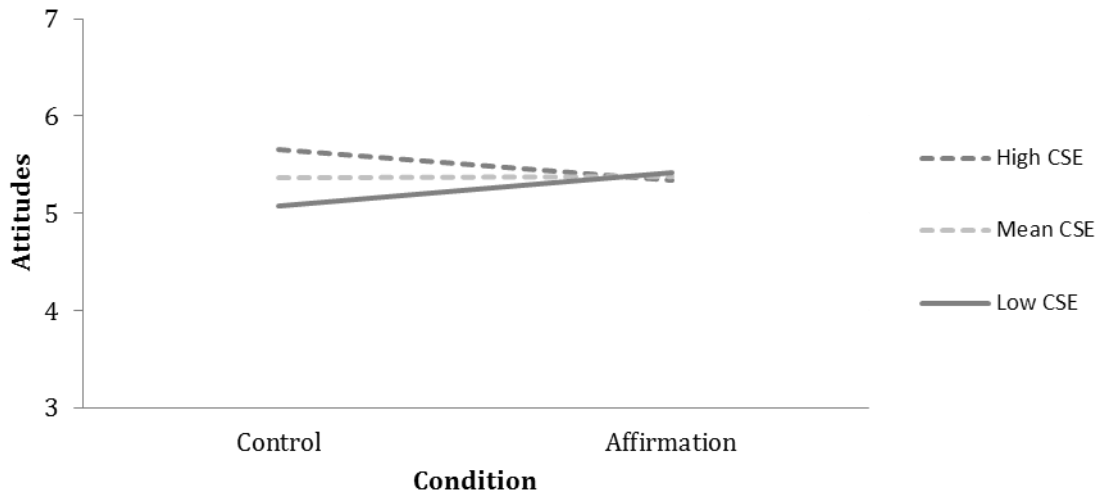


Figure 4. Attitudes regressed onto condition for individuals with low, mean and high levels of contingent self-esteem (CSE).

***Perceived Behavioural Control.*** Condition, entered at step 1, significantly predicted participants' perceived behavioural control scores,  $F(1, 164) = 5.16, p = .02, R^2 = .03$ , with those in the self-affirmation condition reporting greater levels of perceived behavioural control than those in the control condition,  $M_s = 5.67$  and  $5.22$  respectively. The inclusion of the self-regard aspects at step 2 significantly increased the amount of variance accounted for by the model,  $\Delta F(6, 158) = 2.42, p = .03, \Delta R^2 = .08$ . Global self-esteem emerged as a significant linear predictor,  $\beta = .32, t(165) = 3.23, p = .01, d = .50$ , with individuals high in global self-esteem reporting greater levels of perceived behavioural control. While the inclusion of the two-way interaction terms at step 3 did not significantly increase the overall variance in perceived behavioural control accounted for by the model,  $\Delta F(6, 152) = .97, p = .45, \Delta R^2 = .03$ , the interaction

term between condition and contingent self-esteem emerged as a significant linear predictor,  $\beta = -.29$ ,  $t(165) = -2.18$ ,  $p = .03$ ,  $d = -.034$ .

Simple slopes analysis (Figure 5) revealed that for those with low and mean contingent self-esteem scores, there was a significant effect of condition on perceived behavioural control, with participants in the self-affirmation condition reporting greater levels of perceived behavioural control than those in the control condition,  $\beta = .29$ ,  $t(165) = 2.70$ ,  $p = .01$ ,  $d = .42$  (low),  $\beta = .16$ ,  $t(165) = 2.14$ ,  $p = .03$ ,  $d = .33$  (mean). There was no effect of condition on perceived behavioural control for those with high contingent self-esteem scores,  $\beta = .03$ ,  $t(165) = .31$ ,  $p = .76$ ,  $d = .05$ .

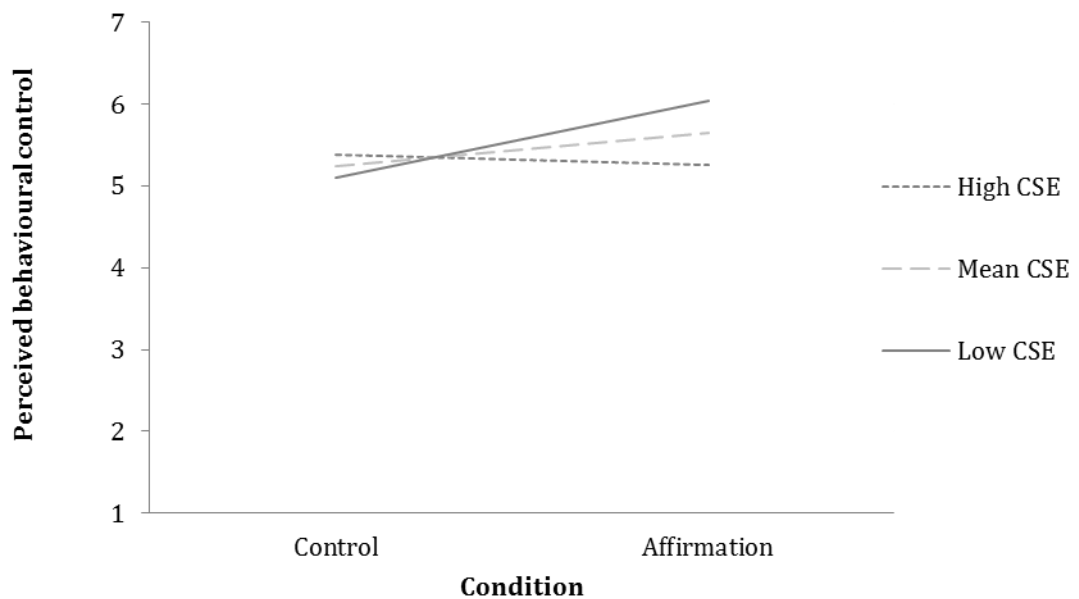


Figure 5. Perceived behavioural control regressed onto condition for individuals with low, mean and high levels of contingent self-esteem (CSE).

**Intentions.** Condition, the self-regard aspects, and the two-way interaction terms did not significantly predict intentions.

**Message derogation.** Condition, the self-regard aspects, and the two-way interaction terms did not significantly predict message derogation.

Moreover, supplementary subsidiary regression analyses revealed no evidence that gender moderated any associations between condition, contingent self-esteem and the outcomes variables.

### **Predicting behavioural outcomes**

A hierarchical multiple regression analysis was conducted in order to determine whether any effect of the self-affirmation manipulation on behaviour at follow-up was moderated by the self-regard aspects. The number of times exercised in the past seven days at Time 1 was entered at step 1 in order to control for any baseline differences in exercise behaviour. Condition (dummy coded; control = 0 and self-affirmation = 1) was entered at step 2. The mean-centred self-regard variables were entered at step 3, and the two-way interactions between condition and the self-esteem aspects were entered at step 4. Time 1 exercise behaviour, entered at step 1, significantly predicted participants' exercise behaviour at follow-up,  $F(1, 141) = 47.64, p = .001, R^2 = .25$ , with a strong positive association between the number of times exercised at Time 1 and the number of times exercised at follow-up,  $\beta = .50, t(141) = 6.90, p = .001, d = 1.16$ . Condition, entered at step 2 did not significantly increase the amount of variance explained by the model,  $\Delta F(1, 141) = 1.79, p = .18, \Delta R^2 = .01$ , nor did the inclusion of the self-regard aspects at step 3,  $\Delta F(6, 135) = 1.15, p = .34, \Delta R^2 = .04$ . Moreover, the inclusion of the two-way interaction terms at step 4 did not significantly increase the amount of variance accounted for,  $\Delta F(6, 129) = 1.54, p = .17, \Delta R^2 = .05$ , and none of the individual interaction terms emerged as significant linear predictors, ( $\beta$ s < .20,  $p$ s > .11).



Table 5.  
*Summary of Hierarchical Multiple Regression Analysis Predicting Exercise Behaviour at Follow-up*

Variables entered	Exercise behaviour at follow-up			
	$\beta$	$\beta$	$\beta$	$\beta$
	Step 1	Step 2	Step 3	Step 4
Baseline exercise behaviour	.50***	.49***	.50***	.48***
Condition		-.10	-.11	-.11
Global self-esteem (GSE)			.09	-.05
Contingent self-esteem (CSE)			.15	.02
Self-esteem instability (SEI)			-.09	-.25
Implicit self-esteem (ISE)			-.02	.10
Self-concept clarity (SCC)			.11	.14
Narcissism (Nar)			-.01	-.05
Condition X GSE				.20
Condition X CSE				.20
Condition X SEI				.19
Condition X ISE				-.17
Condition X SCC				-.04
Condition X Nar				.06
$R^2$	.25	.26	.30	.34
Model F	47.64***	24.85***	7.12***	4.82***
$\Delta R^2$		.01	.04	.05
$\Delta F$		1.79	1.15	1.53

\*\*\* $p < .001$

## Discussion

The findings of the current study provide partial support for the prediction that specific aspects of self-regard might moderate self-affirmation effects. In particular, contingent self-esteem was shown to moderate the impact of self-affirmation on attitudes and perceptions of behavioural control. There was no evidence that any of the other self-regard aspects under investigation moderated the impact of the self-affirmation manipulation on outcomes.

More specifically, the study findings demonstrated that self-affirmed individuals with low levels of contingent self-esteem reported more positive attitudes and greater perceptions of behavioural control in relation to increasing their exercise behaviour, compared to their non-affirmed counterparts. There was also some evidence that the self-affirmation manipulation promoted open processing of the health-risk information for individuals with mean levels of contingent self-esteem, with these individuals also reporting greater perceptions of behavioural control.

By contrast, there was no evidence that self-affirmation resulted in more open processing of the health-risk information for individuals with high contingent self-esteem. Indeed, self-affirmed individuals with high levels of contingent self-esteem reported marginally less positive attitudes towards increasing their exercise behaviour compared to their non-affirmed counterparts, suggesting that self-affirmation might be counterproductive for these individuals.

The current paper thus presents preliminary evidence suggesting that contingent self-esteem might moderate self-affirmation effects. One potential explanation why individuals low in contingent self-esteem might have benefitted more from self-affirmation relates to the nature of the type of self-affirmation manipulation utilised in

the current study. Specifically, we employed a value-based self-affirmation manipulation, which requires individuals to reflect on an important personal value. Arguably, the process of reflecting on a privately held and important value is less likely to boost the self-integrity of individuals with relatively high contingent self-esteem. Instead, it seems intuitively plausible that individuals with high contingent self-esteem might be more likely to be self-affirmed through reflecting on positive external resources (such as successful performance outcomes or gaining approval from others), rather than through reflecting on positive internal resources (such as important personal values).

Cohen & Sherman (2014) contend that the goal of self-affirmation manipulations is to make the individual feel worthy of praise through providing them with opportunities to reflect on positive resources. Crucially, this can be achieved in various ways. Thus, recent research has demonstrated that spending time on one's Facebook page can serve as a self-affirmation manipulation (Toma, 2010; Toma & Hancock, 2013). Such manipulations might better target the type of resources that are central to the sense of self-worth of individuals with high contingent self-esteem. Arguably, this type of self-affirmation manipulation might provide individuals with high contingent self-esteem with a better opportunity to self-affirm in a way that allows them to draw upon domains that are important to their self-worth, such as appearing successful to others (Ryan & Brown, 2003). It would be interesting to explore whether certain types of self-affirmation manipulations might be more effective at promoting open processing of personally relevant health-risk information for individuals with higher levels of contingent self-esteem.

The findings of the current paper suggest that a value-based self-affirmation manipulation is more likely to promote openness to threatening health-risk information

amongst those low in contingent self-esteem. Ironically, however, research findings suggest that it is those high in contingent self-esteem who might be those most in need of health behaviour interventions. For example, high contingent self-esteem has been linked to excessive drinking (Neighbors et al., 2004) and eating disorders (Crocker, 2002). Considering the association between high contingent self-esteem and detrimental health-related behaviours, it is crucial for future research to design effective health promotion campaigns that work for this particular audience.

It is of interest that the current study failed to find any evidence that global self-esteem moderated the effectiveness of the self-affirmation manipulation at promoting more open processing of the health-risk message<sup>1</sup>. This contradicts previous research findings (Study 1; Spencer et al., 2001). One possible explanation for this is that previous papers have failed to take into account specific aspects of self-esteem. Such aspects may be more important in driving the moderating impact of self-affirmation effects. Indeed, the findings of the current study highlight the need to be cautious when treating self-esteem as a homogenous dispositional moderator of self-affirmation effects, as this seems to be an oversimplification.

It is also notable that there was no evidence that any of the other aspects of self-regard under investigation (self-esteem instability, implicit self-esteem, self-concept clarity and narcissism) moderated the effectiveness of the self-affirmation manipulation on outcomes. The findings of the current study suggest that these particular aspects may not be key moderators of the effectiveness of self-affirmation at promoting positive

---

<sup>1</sup> In order to explore this inconsistency further, additional moderated multiple regression analyses were conducted entering only condition, global self-esteem and the interaction term between these variables into the model. There was no evidence that global self-esteem moderated the impact of the self-affirmation manipulation on any of the outcome variables in the resultant analyses.

cognitive and behavioural changes in regard to exercise. However, it is possible that different aspects of self-regard might potentially emerge as important moderators of self-affirmation effects in other behavioural domains.

Contingent self-esteem did not moderate the efficacy of the self-affirmation manipulation for intentions or message derogation. As alluded to previously, it is not uncommon amongst self-affirmation research to find predicted effects for some, but not all, of the outcome variables under investigation (e.g., Armitage et al., 2008).

Furthermore, the absence of an effect of the self-affirmation manipulation on behaviour at follow-up is also consistent with some previous self-affirmation research (e.g., Harris & Napper, 2005; Harris et al., 2007; Reed & Aspinwall, 1998).

There are, of course, some limitations to the current study. Exercise behaviour was measured using self-report measures. Even though it has been demonstrated that such measures are valid (e.g., Miller, Freedson & Kline, 1994) future research should nevertheless aim to replicate the findings employing more objective measures of exercise. Furthermore, common with much other self-affirmation research, students were over-represented in the current study, limiting the generalisation of findings. Future research would benefit from using a stratified sample of the general public. It would also be of interest to explore if the current pattern of findings holds across other health-related behaviours and, as indicated above, across other self-affirmation manipulations.

In summary, the current study found some preliminary evidence to suggest that contingent self-esteem is a moderator of self-affirmation effects. In particular, the findings indicated that individuals with low contingent self-esteem benefitted most from a self-affirmation manipulation aimed at increasing openness to health-risk information. Such findings emphasises the importance of taking into account individual difference

variables, when exploring the efficacy of self-affirmation effects. It is possible that the differential impact of self-affirmation as a function of contingent self-esteem in the current study was in part attributable to the nature of the self-affirmation manipulation employed. Whether different self-affirmation manipulations are more (or less) effective for different individuals represents an area that merits further investigation.

## **Chapter 4: Exploring the potential moderating impact of primed contingent self-esteem on self-affirmation effects**

### **Abstract**

The aim of the present study was to explore whether experimentally primed contingent self-esteem would moderate the effectiveness of self-affirmation at reducing defensive processing of personally relevant health-risk information. Participants ( $N = 139$ ) were exposed to a low contingent self-esteem prime, a high contingent self-esteem prime or a no contingent self-esteem prime. They subsequently completed either a self-affirmation manipulation or an equivalent control task. All participants next read a health-risk message detailing the risks of insufficient exercise and completed a series of measures assessing cognitive indicators of openness to the health-risk message. Participants' exercise behaviour was assessed at 7-day follow-up. There was no evidence to suggest that experimentally primed contingent self-esteem moderated any effect of the self-affirmation manipulation on outcomes. The results revealed that individuals primed with high contingent self-esteem reported marginally more positive attitudes, and significantly more positive intentions, towards increasing their exercise behaviour compared to individuals in the low contingent self-esteem prime conditions. Furthermore, there was a main effect of the self-affirmation manipulation on attitudes and exercise behaviour, with self-affirmed participants reporting marginally more negative attitudes towards increasing their exercise behaviour, but significantly higher levels of exercise at follow-up, compared to their non-affirmed counterparts.

## **Introduction**

At the core of self-affirmation theory is the contention that individuals are continually motivated to maintain global self-integrity, where the latter refers to “a sense of global efficacy, an image of oneself as able to control important adaptive and moral outcomes in one's life” (Cohen & Sherman, 2014, p.336; see also Steele, 1988). Thus, in order to uphold global self-integrity, people often respond defensively to information that threatens this positive view of the self. Whilst this is likely to protect feelings of global self-integrity, it may also result in the individual failing to openly process important information. Critically, however, self-affirmation theory also suggests a technique for reducing defensive processing of threatening information. Specifically, the theory contends that providing an individual with the chance to reinforce feelings of self-integrity, by reflecting on a positive self-related domain, should counter the threat to self-integrity. As a result, global self-integrity is maintained and the individual is able to process the threatening information without responding defensively.

Previous research has documented that individuals frequently respond defensively to personally relevant health-risk information (e.g., Freeman, Hennessy & Marzullo, 2001). Encouragingly, however, there is much evidence to support the prediction that self-affirmation can promote openness to such information (Harris & Epton, 2010; Harris, 2011). Research findings have, for example, shown that self-affirmed individuals report more positive intentions and greater perceptions of behavioural control with regard to reducing the number of cigarettes smoked (Armitage, Harris, Hepton, & Napper, 2008; Harris, Mayle, Mabbott & Napper, 2007) and greater intentions to reduce their alcohol intake (Harris & Napper, 2005). Moreover, with regard to exercise behaviour, Cooke, Trebaczyk, Harris and Wright (2014) demonstrated that self-affirmed individuals report more positive attitudes and intentions



towards increasing their exercise behaviour compared to those in the control condition. Similarly, Jessop, Sparks, Buckland, Churchill and Harris (2014, Study 1) found that self-affirmed individuals report more positive attitudes, greater levels of response-efficacy and marginally greater perceptions of behavioural control towards increasing exercise behaviour, relative to their counterparts in the control condition.

Previous research has also shown that self-affirmation can promote positive behavioural changes after exposure to personally relevant health-risk information, for example, in relation to increasing physical activity (Cooke et al., 2014; Jessop et al., 2014, Study 1), increasing fruit and vegetable consumption (Epton & Harris, 2008) and reducing alcohol consumption (Armitage, Harris & Arden, 2011). However, it is noteworthy that a number of studies have failed to report any effects of self-affirmation on behavioural outcomes (e.g., Harris & Napper, 2005; Harris et al., 2007; Reed & Aspinwall, 1998).

The majority of research into the effectiveness of self-affirmation at promoting open processing of personally relevant health-risk information has not taken into account the moderating role of potential dispositional variables. However, the research reported in Chapters 2 and 3 of this thesis explored the moderating impact of different aspects of self-esteem on self-affirmation effects.

It is well established that self-esteem is a multidimensional construct, comprising several distinct aspects (Heppner & Kernis, 2011). One such key aspect, which emerged as a moderator of self-affirmation effects in the studies described in Chapters 3 and 4, is contingent self-esteem. Contingent self-esteem reflects the extent to which an individual bases their self-esteem on external factors, such as performance outcomes and approval from other people (Zeigler-Hill, Besser & King, 2011). In particular, while individuals with low levels of contingent self-esteem have a secure

sense of self-worth that is not dependent on external factors, individuals with high levels of contingent self-esteem rely on continual external validation in order to maintain feelings of self-worth (Kernis, Lakey & Heppner, 2008).

The study reported in Chapter 3 found that contingent self-esteem moderated the effectiveness of a self-affirmation manipulation at promoting openness to a message detailing the negative consequences of insufficient exercise. Specifically, self-affirmed individuals with low levels of contingent self-esteem reported more positive attitudes and greater perceptions of behavioural control towards increasing their exercise behaviour, compared to their non-affirmed counterparts. By contrast, there was no benefit of the self-affirmation manipulation for individuals with high levels of contingent self-esteem. Indeed, self-affirmed individuals with high contingent self-esteem reported marginally less positive attitudes towards increasing their exercise behaviour compared to their counterparts in the control condition.

Critically, the study reported in Chapter 3 investigated dispositional contingent self-esteem as a moderator of self-affirmation effects. The research evidence suggesting that contingent self-esteem does moderate self-affirmation effects would be considerably strengthened if these results could be replicated when level of contingent self-esteem is experimentally manipulated. Therefore, in order to extend our understanding of the potential moderating role of contingent self-esteem on self-affirmation effects, the aim of the present study was to explore whether experimentally primed high or low levels of contingent self-esteem would moderate the effectiveness of self-affirmation at promoting openness to a health-risk message detailing the health-related risks of insufficient exercise.

Research has demonstrated that it is possible to activate levels of contingent self-esteem by subtly priming individuals to think about relationships where acceptance

and positive regard from the other person is either contingent or non-contingent in nature (e.g., Baldwin, 1994; Baldwin & Holmes, 1987; Baldwin & Sinclair, 1996). In particular, the use of *private audience visualisation tasks*, in which participants are asked to visualise an encounter with someone whose acceptance of them is contingent or non-contingent, has been found to be an effective way of achieving this objective (see Baldwin & Holmes, 1987). This type of priming has been found to activate contingency expectations, which in turn can influence individuals' self-evaluations and perceptions of acceptance from others (Baldwin & Holmes 1987; Baldwin & Sinclair, 1996). For example, Baldwin & Holmes (1987) found that individuals who were asked to visualise an encounter with individuals whose acceptance of them was contingent in nature, reported to feel more evaluated and that the acceptance from the manipulated private audience was contingent.

In line with the findings presented in Chapter 3, it was predicted that self-affirmed individuals primed with low contingent self-esteem would be more open to the health-risk information, compared to their non-affirmed counterparts. Specifically, it was hypothesised that self-affirmed individuals primed with low contingent self-esteem would report more positive attitudes, perceptions of behavioural control, intentions, response-efficacy, and less message derogation compared to their non-affirmed counterparts. It was also predicted that self-affirmed individuals primed with low contingent self-esteem would report the highest levels of exercise at follow-up. By contrast, based on the findings reported in Chapter 3, for individuals primed with high contingent self-esteem it was predicted that the self-affirmation would either have no impact on outcomes or, possibly, could result in less open processing of the health-risk information.

## Methods

### *Participants*

One hundred and eighty-seven participants completed baseline measures of contingent and global self-esteem and the Time 1 questionnaire, including the contingent self-esteem prime and the self-affirmation manipulation. Participants who had been defined as “high exercisers”, i.e., those who exercised on average 4 or more times a week ( $n = 48$ ), were removed from the sample, as it was predicted that they would not be threatened by the health message detailing the risks of insufficient exercise (see Jessop et al., 2014). This left a final sample of 139 participants. Of these, the majority were female (76.97%), students (80.51%) and British (78.41%). Ages ranged from 18-75 years ( $M = 24.99$ ,  $SD = 10.92$ ).

One hundred and fourteen participants completed the Time 2 questionnaire, representing an attrition rate of 17.98%. A series of ANOVAs and Chi-square analyses revealed no significant differences between responders or non-responders at Time 2 in terms of baseline exercise behaviour, global self-esteem, contingent self-esteem, age or condition,  $ps > .16$ . However, non-responders at Time 2 exercised significantly more often in the average week than responders,  $F(1, 137) = 6.50$ ,  $p = .01$ ,  $\eta p^2 = .05$ ,  $Ms = 2.07$  and  $1.49$  respectively. Furthermore, chi-square analysis revealed a significant association between responding at Time 2 and gender, with a higher ratio of women to men responding at Time 2,  $\chi^2(1, N = 139) = 4.61$ ,  $p = .03$ , Cramer's  $V = .18$ .

### *Materials*

Participants completed a series of online questionnaires. The measures were administered in the order they are listed below.

**Baseline Questionnaire.** At baseline, participants completed a questionnaire including the following measures:

**Demographic information.** Participants indicated their age, gender, nationality and current occupation.

**Global self-esteem.** Global self-esteem was assessed using the Rosenberg Self-Esteem Scale (Rosenberg, 1965). An example item from this scale is, “On the whole, I am satisfied with myself”. Responses to all items were given on 4-point scales ranging from *Strongly Disagree* (1) to *Strongly Agree* (4). The scale was found to have an acceptable level of internal reliability,  $\alpha = .86$ . A mean score was calculated for each participant, with higher scores representing higher global self-esteem.

**Contingent self-esteem.** Contingent self-esteem was assessed using the 15-item Contingent Self-Esteem Scale (Kernis & Goldman, 2006). An example item from this scale is, “My overall feelings about myself are heavily influenced by how much other people like and accept me”. Responses to all items were given on a 5-point scale, ranging from *Strongly Disagree* (1) to *Strongly Agree* (5). The scale was found to have an acceptable level of internal reliability,  $\alpha = .87$ . A mean score was calculated for each participant, with higher scores representing higher contingent self-esteem.

**Time 1 Questionnaire.** At time 1, participants completed a questionnaire including the following sections:

**Baseline exercise behaviour.** Participants were informed that, for the purpose of the current study, exercise was defined as, “any moderate to vigorous physical activity, performed in your leisure time, that raises your heart rate, and results in you becoming warm and at least mildly out of breath”. Following Jessop et al. (2014), they subsequently completed the following questions assessing their baseline exercise behaviour; “In the past seven days on how many days have you exercised for 30 minutes or more?” and “In the average week, on how many days do you exercise for 30

minutes or more?”. Responses to both questions were given on eight-point scales ranging from 0 to 7.

***Contingent self-esteem prime.*** Following Baldwin & Holmes (1987) private audience visualisation contingent self-esteem prime, participants in the low contingent self-esteem prime conditions were asked to visualise the following situation: “You are having lunch with a good friend. This is a friend who would stick by you, through good times and bad. Feel the warmth and acceptance with this person. Imagine this situation in as much detail as possible and how it would make you feel”. By contrast, participants in the high contingent self-esteem prime conditions were asked to visualise the following situation: “You are meeting and chatting with a new acquaintance about a class/work assignment that you are both working on. A few minutes later you accidentally overhear this person saying to someone else about you: ‘S/he was really smart....I really like people like that.’ Imagine this situation in as much detail as possible and how it would make you feel”. Participants in the no contingent self-esteem prime conditions were not given any task to complete at this stage in the questionnaire. The contingent self-esteem prime was piloted prior to the study and the results indicated that it was effective at experimentally inducing both low and high contingent self-esteem<sup>1</sup>.

***Self-affirmation manipulation.*** Following Sherman et al. (2000, Study 2), participants in the self-affirmation conditions chose their most important value from a list of 12 different values (e.g., loyalty) and wrote a short statement (2-3 sentences) about why this value was important to them. Participants in the no affirmation

---

<sup>1</sup> A pilot study ( $n = 259$ ) was carried out to evaluate the effectiveness of three alternative contingent self-esteem priming manipulations. They consisted of a private audience visualisation task (Baldwin, 1987), a relational schema prime (Baldwin & Sinclair, 1996) and a sentence unscrambling task. The private audience visualisation most reliably influenced levels of contingent self-esteem and was therefore used in the current study.

conditions chose their least important value from the same list and wrote a short statement (2-3 sentences) about why this value might be important to someone else.

***Importance of selected value.*** Participants rated how important the value that they had chosen to write about was to them on a 7-point scale, ranging from *extremely unimportant* (1) to *extremely important* (7).

***Health message.*** Following the studies reported in Chapters 2 and 3, participants read four short paragraphs about exercise. The first paragraph emphasised that people who do not exercise sufficiently are at risk of developing many serious health problems (e.g., “If you do not do enough exercise, compared to those who do, you are twice as likely to develop heart diseases and type 2 diabetes”). The second paragraph further highlighted these risks, (e.g., “being physically unfit is just as dangerous as smoking in terms of lowering life expectancy”). The third paragraph gave examples of possible exercise activities, and stressed that taking up exercise does not need to be expensive or time-consuming (e.g., “In reality, it is easy to increase the amount of exercise and many forms of exercise are free”). The last paragraph stated that the UK Government guidelines recommend that people exercise for “30 minutes or more on at least 5 days of the week” and highlighted that the responsibility to change lay with the individual. All the information that was presented was factually correct and was based on information from the Department of Health website (Department of Health, 2011).

***Self-feelings.*** Participants’ self-feelings were assessed by asking them to respond to the following statement, “How do you currently feel about yourself...”: on a 7-point scale, ranging from *extremely bad* (1) to *extremely good* (7).

**Mood.** Participants' mood was assessed by asking them to respond to the following statement, "What is your current mood...": on a 7-point scale, ranging from *extremely sad* (1) to *extremely happy* (7).

**Cognitive indicators of openness to the health-risk message.** Participants completed a number of items assessing each of the following indicators of openness to the health-risk message. Responses to all items were given on 7-point scales with appropriate anchors (e.g. *strongly disagree* [1] to *strongly agree* [7]), unless otherwise indicated. Mean scores were calculated for each construct, with higher scores representing higher levels of the construct in question.

**Attitudes.** Participants' attitudes were assessed by asking them to respond to the following statement, "For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days"...: on five pairs of semantic differentials (*extremely bad* [1] to *extremely good* [7], *extremely harmful* [1] to *extremely beneficial* [7], *extremely unpleasant* [1] to *extremely pleasant* [7], *extremely unenjoyable* [1] to *extremely enjoyable* [7] and *extremely worthless* [1] to *extremely valuable* [7]). The scale was found to have an acceptable level of internal reliability,  $\alpha = .72$ .

**Perceived behavioural control.** Perceived behavioural control was assessed by four items, e.g., "If I wanted to I could increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days". The scale was found to have an acceptable level of internal reliability,  $\alpha = .82$ .

**Intentions.** Intentions were assessed using three items, e.g., "I intend to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days". The scale was found to have an acceptable level of internal reliability,  $\alpha = .91$ .



**Response-efficacy.** Response-efficacy was assessed using two items, e.g., “Increasing the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be an effective way to improve my health”,  $r(137) = .64, p = .001$ .

**Message derogation.** Message derogation was assessed using four items, e.g., “I thought the information presented in the health message was overblown”. The scale was found to have an acceptable level of internal reliability,  $\alpha = .80$ .

**Time 2 Questionnaire.** At time 2, participants completed a questionnaire including the following section:

**Behaviour at follow-up.** Participants were reminded of the definition of exercise given at Time 1 and asked to respond to the same item used at Time 1 to assess their exercise behaviour over the past seven days.

### ***Design and Procedure***

This study employed a 3 (contingent self-esteem prime: low contingent self-esteem prime, no contingent self-esteem prime, high contingent self-esteem prime) by 2 (self-affirmation manipulation: no self-affirmation, self-affirmation) prospective experimental design. Participants were randomly allocated to one of the resultant six conditions: low contingent self-esteem prime by no self-affirmation ( $n = 25$ ), low contingent self-esteem prime by self-affirmation ( $n = 27$ ), no contingent self-esteem prime by no self-affirmation ( $n = 19$ ), no contingent self-esteem prime by self-affirmation ( $n = 21$ ), high contingent self-esteem prime by no self-affirmation ( $n = 22$ ) and high contingent self-esteem prime by self-affirmation ( $n = 25$ ).

Data were collected in three waves, with one week between each data collection point. Participants were partly recruited opportunistically via an email message that was sent out to mailing lists of several UK universities, local councils and to contacts of one

of the researchers. Participants were also recruited using the School of Psychology's participant database at the hosting university. The recruitment message contained information about the study, as well as the web link to the baseline questionnaire. Recipients of the recruitment message were encouraged to pass this message on to their contacts. Participants who provided their email addresses when completing measures at baseline were contacted a week later via an email message containing the web link to the Time 1 questionnaire. Those participants who completed the Time 1 questionnaire were again contacted by email one week later and sent the link to the Time 2 questionnaire. As an incentive to participate and in order to deter attrition, a cash prize draw of £100 was offered to participants who completed all three questionnaires. Psychology students at the hosting University were also offered research credits for their participation. The study received approval from the Life Science and Psychology Research Ethics Committee of the hosting university.

## **Results**

The number of times participants reported exercising in the past week at baseline ranged from 0-5 ( $M = 1.44$ ,  $SD = 1.25$ ) and the number of times they reported exercising in the average week ranged from 0-3 ( $M = 1.60$ ,  $SD = 1.09$ ). Participants' global self-esteem scores ranged from 1.40 - 4.00 ( $M = 2.84$ ,  $SD = 0.49$ ) and contingent self-esteem scores ranged from 1.27-4.87 ( $M = 3.5$ ,  $SD = 0.55$ ).

A series of 3 (contingent self-esteem prime: low contingent self-esteem prime, no contingent self-esteem prime, high contingent self-esteem prime) by 2 (self-affirmation manipulation: no self-affirmation, self-affirmation) ANOVAs revealed no significant baseline differences between conditions in terms of age, global self-esteem, contingent self-esteem, baseline exercise behaviour or average weekly exercise

behaviour ( $ps > .13$ ). Chi square analyses revealed no significant association between conditions and gender ( $p = .72$ ).

A series of 3 (contingent self-esteem prime: low contingent self-esteem prime, no contingent self-esteem prime, high contingent self-esteem prime) by 2 (self-affirmation manipulation: no self-affirmation, self-affirmation) ANOVAs was conducted to explore if there was any impact of the contingent self-esteem prime or the self-affirmation manipulation on mood or self-feelings. The resultant ANOVA for mood revealed no significant main effect for the contingent self-esteem prime,  $F(2, 133) = 0.82, p = .45, \eta^2 = .01$ , no significant main effect for the self-affirmation manipulation,  $F(1, 133) = 0.05, p = .83, \eta^2 = .001$ , and no significant interaction effect,  $F(2, 133) = 0.12, p = .89, \eta^2 = .001$ . Similarly, the resultant ANOVA for self-feelings revealed no significant main effect for the contingent self-esteem prime,  $F(2, 133) = 0.53, p = .60, \eta^2 = .01$ , no significant main effect for the self-affirmation manipulation,  $F(1, 133) = 0.40, p = .53, \eta^2 = .01$ , and no significant interaction effect,  $F(2, 133) = 1.03, p = .36, \eta^2 = .02$ .

Furthermore, a one-way ANOVA was conducted to compare participants in the self-affirmation conditions to those in the no-affirmation conditions on the importance they attributed to the value they had selected to write about. As predicted, participants in the self-affirmation conditions rated the value they had chosen to write about as significantly more important to them than did participants in the control conditions,  $F(1, 137) = 215.18, p < .001, \eta^2 = .61$ , overall  $Ms = 6.29$  and  $2.86$ .

**Exploring the effects of primed contingent self-esteem and self-affirmation on cognitive indicators of openness to the health-risk message**

In order to determine whether there was any effect of either the contingent self-esteem prime and/or the self-affirmation manipulation on cognitive outcomes, a series of 3 (contingent self-esteem prime: low contingent self-esteem prime, no contingent self-esteem prime, high contingent self-esteem prime) by 2 (self-affirmation manipulation: no self-affirmation, self-affirmation) ANOVAs was conducted. Participants' mean and standard deviation scores on the various cognitive indicators of openness to the health-risk message, are summarised in Table 6 and the resultant ANOVAs are summarised in Table 7.

Table 6.

*Estimated marginal means and standard deviations scores for cognitive indicators of openness to the health-risk message*

		Self-affirmation condition	Control condition	Marginal Mean
Attitudes	Low CSE	5.23 (0.87)	5.51 (0.88)	5.37 (0.88)
	No CSE	5.12 (0.98)	5.62 (0.64)	5.37 (0.86)
	High CSE	5.73 (0.78)	5.69 (0.72)	5.71 (0.75)
	Marginal Mean	5.36 (0.90)	5.61 (0.76)	
Intentions	Low CSE	4.64 (1.60)	4.57 (1.39)	4.61 (1.49)
	No CSE	4.65 (1.29)	4.95 (1.72)	4.80 (1.50)
	High CSE	5.37 (1.08)	5.21 (1.15)	5.29 (1.11)
	Marginal Mean	4.89 (1.38)	4.91 (1.43)	
PBC*	Low CSE	5.58 (1.27)	5.60 (1.07)	5.59 (1.17)
	No CSE	5.43 (0.96)	5.36 (1.31)	5.39 (1.13)
	High CSE	5.64 (1.01)	5.72 (0.92)	5.68 (0.96)
	Marginal Mean	5.55 (1.09)	5.56 (1.09)	
Response-efficacy	Low CSE	5.74 (1.13)	5.96 (0.95)	5.85 (1.04)
	No CSE	5.60 (0.70)	5.87 (0.91)	5.73 (0.81)
	High CSE	6.06 (0.81)	5.75 (1.19)	5.91 (1.01)
	Marginal Mean	5.80 (0.92)	5.86 (1.01)	
Message derogation	Low CSE	3.88 (1.26)	3.91 (1.31)	3.90 (1.27)
	No CSE	4.31 (1.03)	3.79 (1.40)	4.05 (1.23)
	High CSE	4.12 (1.19)	4.23 (1.26)	4.17 (1.21)
	Marginal Mean	4.10 (1.17)	3.98 (1.31)	

\*PBC = Perceived behavioural control

**Attitudes.** There was a marginally significant main effect of the contingent self-esteem prime on attitudes,  $F(2, 133) = 2.60$ ,  $p = .08$ ,  $\eta p^2 = .04$ . Post hoc comparisons using the Tukey HSD test indicated that there was no significant difference between participants in the low contingent self-esteem prime conditions and those in the no

contingent self-esteem prime conditions on attitude scores,  $p = .99$  (marginal means = 5.37 and 5.37). Similarly, there was no significant difference between participants in the high contingent self-esteem prime conditions and those in the no contingent self-esteem prime conditions,  $p = .12$  (marginal means = 5.71 and 5.37), although it is notable that this post hoc contrast is approaching statistical significance. Post hoc comparisons further revealed a marginally significant difference between participants in the high contingent self-esteem prime conditions and those in the low contingent self-esteem prime conditions,  $p = .098$  (marginal means = 5.71 and 5.37). There was also a marginally significant main effect of the self-affirmation manipulation on attitudes,  $F(1, 133) = 3.08$ ,  $p = .08$ ,  $\eta p^2 = .02$ . Unexpectedly, participants in the no self-affirmation conditions reported marginally more positive attitudes towards increasing exercise behaviour, compared to those in the self-affirmation conditions (marginal means = 5.61 and 5.36). However, critically, there was no significant interaction between the self-affirmation manipulation and contingent self-esteem prime on attitudes towards increasing exercise behaviour,  $F(2, 133) = 1.16$ ,  $p = .32$ ,  $\eta p^2 = .02$ . Therefore, there was no evidence that the contingent self-esteem prime moderated any impact of the self-affirmation manipulation on attitudes towards increasing exercise behaviour.

***Intentions.*** There was a significant main effect of the contingent self-esteem prime on intentions,  $F(2, 133) = 3.14$ ,  $p = .05$ ,  $\eta p^2 = .05$ . Post hoc comparisons using the Tukey HSD test indicated that participants in the high contingent self-esteem prime conditions reported more positive intentions towards exercise compared to individuals in the low contingent self-esteem prime conditions,  $p = .04$  (marginal means = 5.29 and 4.61). There were no significant differences between participants in the high contingent self-esteem prime conditions and those in the no contingent self-esteem prime conditions,  $p = .21$  (marginal means = 5.29 and 4.80), or between participants in the low

contingent self-esteem prime conditions and those in the no contingent self-esteem prime conditions,  $p = .81$  (marginal means = 4.61 and 4.80), on intention scores. There was no significant main effect of the self-affirmation manipulation on intentions,  $F(1, 133) = 0.10$ ,  $p = .93$ ,  $\eta p^2 = .01$ . Moreover, there was no significant interaction between the self-affirmation manipulation and contingent self-esteem prime on intentions,  $F(2, 133) = 0.32$ ,  $p = .72$ ,  $\eta p^2 = .01$ . Therefore, there was no evidence that the contingent self-esteem prime moderated any impact of the self-affirmation manipulation on intentions towards increasing exercise behaviour.

There were no significant effects of the contingent self-esteem prime, the self-affirmation manipulation or the interaction term between on perceived behavioural control, response-efficacy or message derogation ( $ps > .28$ ,  $\eta p^2$ s  $< .02$ ).

Controlling for baseline levels of global and contingent self-esteem in the analyses reported above did not alter the pattern of findings.

Table 7  
*Summary of ANOVAs predicting indicators of openness to the health-risk message*

	Attitudes			Intentions			Perceived behavioural control			Response-efficacy			Message derogation		
	<i>df</i>	<i>F</i>	$\eta p^2$	<i>df</i>	<i>F</i>	$\eta p^2$	<i>df</i>	<i>F</i>	$\eta p^2$	<i>df</i>	<i>F</i>	$\eta p^2$	<i>df</i>	<i>F</i>	$\eta p^2$
CSE prime	2, 133	2.60	.04	2, 133	3.14*	.05	2,133	0.47	.01	2, 133	0.36	.01	2, 133	0.62	.01
SAM	1, 133	3.08	.02	1,133	0.10	.01	1,133	0.01	.01	1, 133	0.14	.00	1,133	0.36	.00
CSE prime x SAM	2, 133	1.16	.02	2,133	0.32	.01	2, 133	0.05	.00	2, 133	1.27	.02	2,133	0.80	.01

*Note.* CSE = Contingent self-esteem, SAM = Self-affirmation manipulation

\* $p < .05$



### **Exploring the effects of primed contingent self-esteem and self-affirmation on exercise behaviour**

In order to determine whether there was any effect of either the contingent self-esteem prime and/or the self-affirmation manipulation on exercise behaviour at follow-up a 3 (contingent self-esteem prime: low contingent self-esteem prime, no contingent self-esteem prime, high contingent self-esteem prime) by 2 (self-affirmation manipulation: no self-affirmation, self-affirmation) ANCOVA was conducted. Number of times exercised in the past 7 days at Time 1 was entered as a covariate. This analysis revealed no significant main effect of the contingent self-esteem prime on exercise behaviour at follow-up,  $F(2, 107) = 0.65, p = .53, \eta p^2 = .01$ . However, there was a significant main effect of the self-affirmation manipulation on exercise behaviour at follow-up,  $F(1, 107) = 4.42, p = .04, \eta p^2 = .04$ , with participants in the self-affirmation condition reporting higher levels of exercise at follow-up compared to those in the control condition (marginal means = 2.21 and 1.68). Moreover, critically, there was no significant two-way interaction effect between self-affirmation manipulation and contingent self-esteem prime on exercise behaviour at follow-up,  $F(2, 107) = 1.19, p = .31, \eta p^2 = .02$ .

Therefore, there was no evidence that the contingent self-esteem prime moderated any impact of the self-affirmation manipulation on exercise behaviour at follow-up.

Controlling for baseline levels of global and contingent self-esteem in the analysis reported above did not alter the pattern of findings.

### **Discussion**

The findings of the present study do not support the main hypothesis that experimentally induced contingent self-esteem would moderate the effectiveness of a

self-affirmation manipulation at promoting openness to a message detailing the negative consequences of insufficient exercise. Thus, there was no evidence that the contingent self-esteem prime moderated the impact of the self-affirmation manipulation on cognitive outcomes or exercise behaviour at follow-up.

The lack of evidence for a moderating role of primed contingent self-esteem on self-affirmation effects is inconsistent with the research findings reported in Chapter 3, which found that dispositional levels of contingent self-esteem moderated the impact of self-affirmation. Specifically, self-affirmed individuals with low levels of contingent self-esteem reported more open processing of health-related information. By contrast, self-affirmation did promote open processing for individuals with high contingent self-esteem. Indeed, there was evidence suggesting that self-affirmation can backfire for this group.

One potential explanation for the absence of moderating effects in the present study could be related to the priming manipulation used. Arguably, it is possible that the contingent self-esteem prime was not effective at inducing low or high levels of contingent self-esteem. However, as mentioned previously, a pilot study indicated that this manipulation was successful at priming both low and high levels of contingent self-esteem. Furthermore, previous research has demonstrated that contingent self-esteem can successfully be experimentally activated through the use of priming measures (e.g., Baldwin, 1994; Baldwin & Holmes, 1987; Baldwin & Sinclair, 1996).

Alternatively, it is likely that there are qualitative differences between experimentally activated levels of contingent self-esteem and dispositional level of contingent self-esteem. Such potential differences may result in the moderating impact of contingent self-esteem on self-affirmation effects reported in Chapter 3 not being replicated when contingent self-esteem is experimentally activated.

Unexpectedly, the findings of the present study revealed a main effect of the contingent self-esteem prime on cognitive outcomes. Specifically, individuals primed with high contingent self-esteem reported marginally more positive attitudes towards increasing their exercise behaviour compared to individuals in the low contingent self-esteem prime conditions. Moreover, individuals primed with high contingent self-esteem reported significantly more positive intentions towards increasing their exercise behaviour compared to individuals in the low contingent self-esteem prime condition.

Considering that previous research has suggested that individuals with high contingent self-esteem are usually at higher risk of engaging in health-detrimental behaviours (e.g., Crocker, 2002; Neighbors et al., 2004) these findings are surprising. One potential explanation for the finding that individuals primed with high contingent self-esteem reported more positive attitudes and intentions could be related to desirability biases. Priming individuals with high levels of contingent self-esteem might result in them being more preoccupied with approval from other people. Consequently, these participants may have experienced an increase in self-presentational concerns, leading them to be more motivated to report cognitions that they think the experimenter would approve of. Alternatively, it is conceivable that priming individuals with high contingent self-esteem resulted in them being better able to openly process the health-risk message. However, this explanation is not consistent with previous research, which has demonstrated that high levels of contingent self-esteem are associated with defensive responses to information that threatens self-esteem (Kernis, Granneman & Barclay, 1992; Ziegler-Hill, Clark & Beckman, 2011).

Unexpectedly, while there was a marginally significant main effect of self-affirmation on cognitive outcomes, it was found that self-affirmed individuals reported less positive attitudes towards increasing their exercise behaviour. This finding is not

consistent with the prediction that self-affirmation should result in more open processing of personally relevant health-risk information. Furthermore, this finding conflicts with previous research suggesting that self-affirmed participants report more positive attitudes towards increasing their exercise behaviour compared to non-affirmed participants (Cooke et al., 2014; Jessop et al., (2014, Study 1). However, the absence of significant main effects for self-affirmation on the majority of cognitive outcomes reported in the present study is consistent with the other studies of current research programme.

Furthermore, the present study found evidence suggesting that the self-affirmation manipulation influenced health behaviour at follow-up. Specifically, individuals in the self-affirmation conditions reported significantly higher levels of exercise at follow-up, compared to individuals in the no self-affirmation conditions. This is in line with other studies that also found that self-affirmed individuals reported higher levels of exercise at follow-up, compared to non-affirmed counterparts (Cooke et al., 2014; Jessop et al, 2014, Study 1).

One limitation to the current study is the reliance on a self-report measure of exercise behaviour. Despite previous research demonstrating that self-report measures can be a valid and reliable means of measuring exercise behaviour (Miller, Freedson & Kline, 1994), future research would benefit from including a more objective measure of exercise. Moreover, although common amongst self-affirmation research, it is notable that students were over-represented in the current sample. Furthermore, the majority of the sample was female. Together, these factors limit the generalisability of the research findings. Thus, future research would benefit from using a stratified sample of the general public.

In summary, this is the first paper to explore whether experimentally primed level of contingent self-esteem would moderate the effectiveness of a self-affirmation manipulation at promoting open processing of personally relevant health-risk information. The findings revealed no support for the prediction that experimentally primed level of contingent self-esteem would moderate the effect of self-affirmation on outcomes. Future research might benefit from exploring the interactive effects of self-affirmation and experimentally primed contingent self-esteem using alternative means of priming this construct.

## **Chapter 5: Exploring the role of global self-esteem and contingent self-esteem as moderators of self-affirmation effects**

### **Abstract**

The present study examined the moderating role of global self-esteem and contingent self-esteem on the capacity of self-affirmation to promote open processing of a message describing the link between alcohol consumption and breast cancer. At Time 1, female participants ( $N = 125$ ) completed either a self-affirmation manipulation or control equivalent prior to reading the health-risk information. They then completed a series of cognitive outcome measures relating to their alcohol consumption. One week later, participants completed a measure assessing their alcohol consumption over the past 7 days. Results revealed that global self-esteem moderated the impact of the self-affirmation manipulation on perceptions of behavioural control and behaviour at follow-up. Specifically, there was a trend for self-affirmed individuals with low global self-esteem to report greater perceptions of behavioural control, together with less alcohol consumption at follow-up, compared to their non-affirmed counterparts. By contrast, there was a trend for individuals with high global self-esteem to report lower perceptions of behavioural control and more alcohol consumption at follow-up, relative to their non-affirmed counterparts. Furthermore, there was some evidence that contingent self-esteem marginally moderated self-affirmation effects. There was a trend for self-affirmed individuals with low contingent self-esteem to report greater perceptions of behavioural control and for self-affirmed individuals with high contingent self-esteem to report lower perceptions of behavioural control, compared to their non-affirmed counterparts.

## **Introduction**

A central principle of self-affirmation theory is the assertion that individuals are continually motivated to uphold feelings of global self-integrity (Steele, 1988). Global self-integrity has been described as having “a sense of global efficacy, an image of oneself as able to control important adaptive and moral outcomes in one's life” (Cohen & Sherman, 2014, p. 336; see also Steele, 1988). The theory further predicts that in order to maintain feelings of global self-integrity, individuals tend to respond defensively to information that contradicts this view. Although this response may result in global self-integrity being restored, it is also likely to hinder the individual from openly processing potentially important information. This tendency to respond defensively is evident when individuals are presented with personally relevant and negative information concerning their health.

As the majority of people want to view themselves as healthy, information that conflicts with this view of the self is likely to be processed defensively (Cohen & Sherman, 2014). Indeed, previous research has frequently demonstrated the apparent tendency for individuals to respond defensively to personally relevant health-risk information (Freeman, Hennessy & Marzullo, 2001; Liberman & Chaiken, 1992; van Riet & Ruiter, 2011; Sherman, Nelson & Steele, 2000). Critically, however, self-affirmation theory further suggests that bolstering self-integrity in an important self-related domain can counteract such defensive responses, as global feelings of self-integrity remain intact and, hence, the individual is less motivated to respond to the threatening information in a defensive manner.

Encouragingly, a body of research suggests that self-affirmation manipulations have the capacity to promote open processing of personally relevant health-risk information. Studies have, for example, shown that self-affirmed participants report

more positive attitudes and intentions, self- and response-efficacy towards sunscreen use (Jessop, Simmonds & Sparks, 2009) and more positive intentions and perceptions of behavioural control in relation to reducing the number of cigarettes smoked (Armitage, Harris, Hepton, & Napper, 2008; Harris, Mayle, Mabbott & Napper, 2007).

Furthermore, self-affirmed participants have been found to report more openness to health-risk messages detailing the dangers of alcohol consumption. For example, self-affirmed participants report higher risk perceptions regarding the dangers of alcohol consumption and greater intentions to reduce their alcohol consumption (Harris & Napper, 2005), less derogation of a message detailing the risks of alcohol consumption (Armitage, Harris & Arden, 2011) and more attentional bias towards such a message (Klein & Harris, 2009).

It is notable that the success of self-affirmation manipulations at producing positive changes in cognitions relating to behaviour change does not always hold for all of the outcome variables. For example, while Harris & Napper (2005) found that self-affirmation boosted intentions to reduce one's alcohol consumption, there was no effect of this experimental manipulation on attitudes or perceptions of behavioural control (Harris & Epton, 2009). Similarly, Armitage and colleagues (2008) found no effect of self-affirmation on participants' self-efficacy regarding smoking cessation.

There is an increasing amount of evidence suggesting that self-affirmation manipulations also have the ability to promote actual health behaviour changes that are durable over time, (Armitage et al., 2011; Cooke, Trebaczyk, Harris & Wrig, 2014; Epton & Harris, 2008; Jessop, Sparks, Buckland, Harris & Churchill, 2014), although it is noteworthy that the research evidence in this area has generated mixed findings (see Harris & Napper, 2005; Harris et al., 2007; Reed & Aspinwall, 1998).



Applications of self-affirmation theory to health-related behaviours have demonstrated that individual level of risk might be an important moderator, with studies finding that the effects of self-affirmation are typically most apparent for those at higher risk (Armitage et al., 2008; Harris & Napper, 2005; Harris et al., 2007). Less research has explored the potential moderating role of dispositional variables. However, one key set of dispositional variables that have received some support as potential moderators of self-affirmation effects are aspects of self-esteem.

As described in Study 1, global self-esteem was found to moderate the impact of the effectiveness of a self-affirmation manipulation at promoting open processing of a health-risk message detailing the risks of insufficient exercise. Specifically, self-affirmed individuals with low global self-esteem reported more positive attitudes and intentions towards increasing their exercise behaviour, together with less derogation of the health-risk message, compared to their non-affirmed counterparts. By contrast, there was no effect of the self-affirmation manipulation for individuals with high global self-esteem.

In a further exploration of the moderating role of self-esteem on self-affirmation effects, Study 2 (Chapter 3) found evidence suggesting that contingent self-esteem may be an important moderator of the effectiveness of self-affirmation at promoting open processing of personally relevant health-risk information concerning exercise. In particular, self-affirmed individuals with low levels of contingent self-esteem reported more positive attitudes and greater perceptions of behavioural control in relation to increasing their exercise behaviour, compared to their non-affirmed counterparts. Moreover, the results suggested that self-affirmation might be counter-productive for individuals with high contingent self-esteem, as self-affirmed individuals with high

contingent self-esteem reported marginally less positive attitudes towards increasing their exercise behaviour, relative to their non-affirmed counterparts.

In light of the findings reported in Chapters 2 and 3, the aim of the present study was to extend these findings by exploring whether global self-esteem and contingent self-esteem would moderate the effectiveness of a self-affirmation manipulation on outcomes, when using a different self-affirmation manipulation. Whilst the previous studies in the research programme have used values-based affirmation manipulations, the current study used a kindness-based affirmation (e.g., Reed & Aspinwall, 1998).

Furthermore, an additional aim of the current study was to explore whether the moderating effect of global self-esteem and contingent self-esteem would hold in the context of a different health-related behaviour to exercise. Thus, the decision was made to focus on alcohol consumption. Indeed, to the best of the author's knowledge, no previous studies have explored the moderating impact of aspects of self-esteem on self-affirmation effects in relation to alcohol consumption. Alcohol consumption has been implicated in the development of over 60 different medical conditions (Room, Babour & Rehm, 2005). In particular, high alcohol consumption is associated with increased levels of cardiovascular disease (Corrao, Rubbiati, Bagnardi, Zambon & Poikolainen, 2000) and cancer (Smith-Warner et al., 1998).

Based on the findings reported in Chapter 2 and 3, it was hypothesised that global self-esteem and contingent self-esteem would moderate the effectiveness of a self-affirmation manipulation at promoting openness to information detailing the negative consequences of alcohol consumption. Specifically, it was hypothesised that any benefit of the self-affirmation manipulation – as evidenced by more positive cognitions regarding reducing one's alcohol intake and lower levels of alcohol

consumption at follow-up – would be particularly apparent for (i) individuals low in global self-esteem and (ii) individuals low in contingent self-esteem.

## Method

### *Participants*

One hundred and forty-eight females completed baseline measures of global and contingent self-esteem and the Time 1 questionnaire, which included the self-affirmation manipulation. Participants who indicated that their baseline level of alcohol consumption was 0 units ( $n = 23$ ) were not included in the subsequent analyses as these individuals were unlikely to perceive a health message outlining the risks associated with alcohol consumption as threatening. The final sample thus comprised 125 participants; ages ranged from 18-65 ( $M = 32.33$ ,  $SD = 12.82$ ) and the majority of the sample were British nationals (71.54%). With regard to current occupation, 48.40% were employed, 43.50% were students and the remaining 8.10% reported their status as unemployed or “other”.

Ninety-seven participants also completed the final questionnaire at Time 2, representing an attrition rate of 22.40%. One-way ANOVAs revealed no significant differences for responders and non-responders at Time 2 in terms of contingent self-esteem scores,  $p = .29$ . However, responders at Time 2 were found to be significantly older than non-responders,  $F(1, 121) = 4.33$ ,  $p = .04$ ,  $\eta p^2 = .05$ ,  $Ms = 33.58$  and  $27.85$  respectively. Furthermore, responders at Time 2 reported significantly higher levels of global self-esteem compared to non-responders,  $F(1, 123) = 9.06$ ,  $p = .003$ ,  $\eta p^2 = .07$ ,  $Ms = 3.05$  and  $2.74$  respectively, together with higher levels of alcohol consumption at baseline,  $F(1, 123) = 4.83$ ,  $p = .03$ ,  $\eta p^2 = .04$ ,  $Ms = 15.99$  and  $10.22$  respectively. Chi-

square analyses revealed no significant association between responding at Time 2 and condition,  $p = .54$ .

### ***Materials***

Participants completed a series of online questionnaires at three time points. Unless stated otherwise, materials were administered in the order described below.

#### **Baseline measures of self-esteem**

***Demographic information.*** Participants were asked to indicate age, ethnicity and current occupation.

***Global self-esteem.*** Global self-esteem was assessed using the 10-item *Rosenberg self-esteem* Scale (1965). An example item from this scale is, “On the whole, I am satisfied with myself”. Responses to all items were given on 4-point scales ranging from *Strongly Disagree* (1) to *Strongly Agree* (4). The scale was found to have an acceptable level of internal reliability,  $\alpha = .86$ . For each participant, a mean score was calculated, with higher scores representing higher global self-esteem.

***Contingent self-esteem.*** Contingent self-esteem was assessed using the 15-item *Contingent self-esteem* Scale (Kernis & Goldman, 2006). An example item from this scale is, “My overall feelings about myself are heavily influenced by how much other people like and accept me”. Responses to all items were given on a 5-point scale, ranging from *Strongly Disagree* (1) to *Strongly Agree* (5). The scale was found to have an acceptable level of internal reliability,  $\alpha = .88$ . For each participant, a mean score was calculated, with higher scores representing higher contingent self-esteem.

## Time 1 Questionnaire

**Baseline behaviour.** Following Armitage et al.'s (2011) adapted version of the timeline fallback technique (Sobell & Sobell, 1992) participants were asked to indicate how much alcohol they had consumed within the last 7 days. Specifically, they were asked to report the type of alcohol they had consumed (i.e., beer, wine, spirits), what type of container it was in (i.e., small glass, can, pint, single or double measure) and the number of each of these drinks they had consumed on each day in the past week.

**Self-affirmation manipulation.** Following Reed & Aspinwall (1998), participants in the “kindness affirmation” condition were given a task that involved indicating whether they had previously performed 10 acts of kindness (e.g., Have you ever been considerate of another person’s feelings?). If they responded in the affirmative, a space was provided for the participant to write a short statement describing this event. Participants in the control condition were given a structurally identical but neutral task that required them to answer questions about personal opinions (e.g., I think the colour blue looks great on most people).

**Health message.** Following Harris & Napper (2005), participants were presented with a health message of 283 words outlining the link between alcohol consumption and breast cancer. The health message was presented on one page of the online questionnaire, divided into seven short paragraphs. The message first outlined research findings suggesting that that consuming alcohol is related to an increased risk of developing breast cancer, (e.g., “The UK Million Women Survey showed an increase in risk of breast cancer of about 7% to 12% with every extra unit of alcohol per day”). The message also indicated that an effective way to reduce one’s risk of developing breast cancer is to reduce one’s alcohol intake (e.g., “If you want to do everything you can to lower your breast cancer risk, limiting how much alcohol you drink makes sense”).

**Cognitive indicators of openness to the health-risk message.** Participants were next asked to complete a number of items assessing each of the following cognitive indicators of openness to the health-risk message. Responses to all items were given on 7-point scales with appropriate anchors (e.g. *strongly disagree* [1] to *strongly agree* [7]), unless otherwise indicated. Mean scores were calculated for each participant, with higher scores indicating higher levels of the construct in question.

**Attitudes.** Participants' attitudes towards decreasing the amount of alcohol they consumed over the next 7 days were assessed by asking them to respond to the following statement, "For me to reduce the amount of alcohol I consume over the next 7 days would be ..."; on five pairs of semantic differentials (*extremely bad* [1] to *extremely good* [7], *extremely harmful* [1] to *extremely beneficial* [7], *extremely unpleasant* [1] to *extremely pleasant* [7], *extremely unenjoyable* [1] to *extremely enjoyable* [7] and *extremely worthless* [1] to *extremely valuable* [7]). The scale was found to have an acceptable level of internal reliability,  $\alpha = .78$ .

**Perceived behavioural control.** Participants' perceived behavioural control in relation to decreasing the amount of alcohol they consumed over the next 7 days was assessed using four items. An example from this scale is "If I wanted to I could reduce the amount of alcohol I consume over the next 7 days",  $\alpha = .62$ .

**Intention.** Participants' intention to decrease the amount of alcohol they consumed over the next 7 days was assessed using three items. An example from this scale is "I intend to reduce the amount of alcohol I consume over the next 7 days",  $\alpha = .95$ .

**Subjective Norms.** Participants' subjective norms in relation to decreasing the amount of alcohol they consumed over the next 7 days was measured using two items.

An example from this scale is “Most people who are important to me think I should reduce the amount of alcohol I consume over the next 7 days”,  $r(123) = .52, p = .001$ .

***Descriptive Norms.*** Participants’ descriptive norms in relation to decreasing the amount of alcohol they consumed over the next 7 days were measured using two items. An example from this scale is “Most people who are important to me try to reduce the amount of alcohol they consume”  $r(123) = .75, p = .001$ .

***Moral Norms.*** Participants’ moral norms in relation to decreasing the amount of alcohol they consumed over the next 7 days was measured using four items. An example from this scale is “Reducing the amount of alcohol I consume over the next 7 days would feel like I was doing the morally right thing”,  $\alpha = .87$ .

***Anticipated Regret.*** Participants’ anticipated regret in relation to decreasing the amount of alcohol they consume over the next 7 days was measured with two items. An example from this scale is “If I did not reduce the amount of alcohol I consume over the next 7 days, I would feel regret”  $r(123) = .73, p = .001$ .

***Identity.*** Participants’ identification in relation to decreasing the amount of alcohol they consumed over the next 7 days was assessed using three items. An example from this scale is “I am not the type of person who would reduce the amount of alcohol I consume over the next 7 days”,  $\alpha = .73$ .

## **Time 2**

***Alcohol consumption at follow-up.*** Participant were again asked to complete the same measure of alcohol consumption that they responded to at Time 1.

## ***Design and Procedure***

This study adopted a prospective experimental design. Data were collected online in three waves. Participants were allocated randomly to one of the two experimental conditions, the self-affirmation condition ( $n = 60$ ) or the control condition ( $n = 65$ ).

Prospective participants were recruited via an email message that was sent out to several UK universities and to contacts of the researcher. The recruitment email contained information about the study, as well as the web link to the baseline questionnaire. Participants were contacted via email a week after completing the initial baseline measures and provided with the web link to the Time 1 questionnaire. A week after completing the Time 1 questionnaire, participants were again contacted by email and sent link to the Time 2 questionnaire. In order to encourage recruitment and deter attrition, participants who completed all three questionnaires were entered into a cash prize draw. The study received ethical approval by the Life Science and Psychology Research Ethics Committee of the hosting university.

## Results

Participants' reported baseline consumption of alcohol over the previous week ranged from 1.00 - 67.40 units ( $M = 14.69$ ,  $SD = 12.41$ ). Global self-esteem scores ranged from 1.60 - 4.00 ( $M = 2.98$ ,  $SD = .49$ ) and contingent self-esteem scores ranged from 1.63-4.69 ( $M = 3.55$ ,  $SD = .54$ ).

A series of one-way ANOVAs revealed no significant differences between the control and self-affirmation condition in terms of age, global self-esteem, contingent self-esteem and baseline alcohol consumption,  $p > .21$ . There was, however, a marginally significant difference between conditions on contingent self-esteem scores, with participants in the control condition reporting marginally higher levels of contingent self-esteem,  $F(1, 123) = 3.81$ ,  $p = .053$ ,  $\eta^2 = .03$ ,  $M_s = 3.64$  and  $3.45$  respectively.



**Cognitive indicators of openness to the health-risk message**

A series of hierarchical multiple regression analyses were carried out to determine the effect of the self-affirmation manipulation, the self-esteem aspects and the interaction effects between these variables on the cognitive indicators of openness to the health-risk message. Prior to analysis, global self-esteem scores and contingent self-esteem scores were mean-centred and the interaction terms were constructed from the mean-centred variables. Condition (dummy coded; control condition = 0, affirmation condition = 1) was entered at step 1, global self-esteem scores and contingent self-esteem scores were entered at step 2, the two-way interaction terms were entered at step 3 and the three-way interaction terms were entered at step 4.

The resultant regression equations are summarised in Table 8. As the models predicting intentions, subjective norm, descriptive norm, moral norm, anticipated regret and identity failed to achieve statistical significance, these analyses are not elaborated on further below.

Table 8 (Part 1).

*Summary of Hierarchical Multiple Regression Analyses Predicting Indicators of Openness to the Health-Risk Message*

Variables entered	Attitudes				Perceived Behavioural Control				Intention				Subjective Norm			
	S 1	S2	S3	S4	S 1	S2	S3	S4	S 1	S2	S3	S4	S 1	S2	S3	S4
	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$
Condition	.03	.04	.04	.06	.01	-.01	.01	.03	.03	.03	.02	.05	.07	.09	.09	.13
Global self-esteem (GSE)		.22*	.29*	.29*		.22*	.46**	.46**		-.02	-.04	-.04		-.05	-.07	-.05
Contingent self-esteem (CSE)		.13	.11	.13		.01	.20	.23		.06	.03	.05		.08	.05	-.08
Condition X GSE			-.12	-.13			-.36*	-.37**			.03	.03			.02	.01
Condition X CSE			-.03	-.06			-.27	-.30			.01	-.02			.01	-.04
GSE X CSE			.09	.05			-.07	-.14			.07	.02			.07	-.02
Condition X GSE X CSE				.08				.10				.08				.14
R <sup>2</sup>	.01	.04	.06	.06	.01	.05	.11	.11	.01	.03	.01	.01	.01	.02	.02	.03
Model F	.08	1.73	1.17	1.10	.01	1.97	2.39	2.10	.03	.17	.19	.21	.66	.72	.45	.52
$\Delta R^2$		.04	.02	.01		.05	.06	.01		.01	.01	.01		.01	.01	.01
$\Delta F$		2.55	.62	.35		2.94	2.72	.45		.25	.21	.33		.75	.18	1.00

\* $p < .05$ ., \*\* $p < .01$ ., \*\*\* $p < .001$ 

Note. S1 = Step 1, S2 = Step 2, S3 = Step 3, S4 = Step 4

Table 8 (Part 2).

*Summary of Hierarchical Multiple Regression Analyses Predicting Indicators of Openness to the Health-Risk Message*

Variables entered	Descriptive Norm				Moral Norms				Anticipated regret				Identity			
	S 1	S2	S3	S4	S 1	S2	S3	S4	S 1	S2	S3	S4	S 1	S2	S3	S4
	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$
Condition	-.15	-.17	-.16	-.16	-.01	.01	.01	.05	.02	.04	.04	-.01	.04	.04	.04	.02
Global self-esteem (GSE)		-.01	.01	.01		-.01	-.07	-.07		-.08	-.15	-.15		-.04	-.16	-.17
Contingent self-esteem (CSE)		-.11	-.06	-.06		.09	.13	.16		.06	.08	-.05		.02	.02	-.01
Condition X GSE			-.03	-.03			.08	.07			.12	.13			.18	.19
Condition X CSE			-.16	-.15			-.06	-.11			.02	.06			-.01	.02
GSE X CSE			.18	.18			.07	-.02			-.07	.02			.06	.12
Condition X GSE X CSE				-.01				.14				-.13				-.09
$R^2$	.02	.03	.07	.07	.001	.01	.02	.03	.001	.01	.03	.03	.01	.01	.02	.03
<i>Model F</i>	2.82	1.42	1.54	1.31	.03	.43	.45	.53	.06	.57	.49	.55	.17	.15	.49	.47
$\Delta R^2$		.01	.04	.001		.01	.01	.01		.01	.01	.01		.01	.02	.01
$\Delta F$		.73	1.63	.01		.64	.47	1.00		.83	.43	.89		.13	.83	.36

\* $p < .05$ ., \*\* $p < .01$ ., \*\*\* $p < .001$ 

Note. S1 = Step 1, S2 = Step 2, S3 = Step 3, S4 = Step 4

**Attitude.** Condition, entered at step 1, did not significantly predict participants' attitude scores,  $F(1, 123) = 0.08, p = .77, R^2 = .001$ . However, the inclusion of the self-esteem aspects at step 2 resulted in a marginally significant increase in the amount of variance accounted for by the model,  $\Delta F(2, 121) = 2.55, p = .08, \Delta R^2 = .04$ . In particular, global self-esteem emerged as a significant linear predictor, with participants with high global self-esteem reporting more positive attitude scores,  $\beta = .22, t(124) = 2.23, p = .03, d = 0.40$ . The two-way interaction terms entered into the model at step 3 and the inclusion of the three-way interaction term entered at step 4 both failed to significantly increase the amount of variance explained by the model,  $\Delta F(3, 118) = 0.62, p = .60, R^2 = .02, \Delta F(1, 117) = 0.35, p = .56, \Delta R^2 = .002$  respectively.

**Perceived Behavioural Control.** Condition, entered at step 1, did not significantly predict participants' perceived behavioural control scores,  $F(1, 123) = 0.01, p = .92, R^2 = .001$ . However, the inclusion of the self-esteem aspects at step 2 resulted in a marginally significant increase in the amount of variance accounted for by the model,  $\Delta F(2, 121) = 2.95, p = .06, \Delta R^2 = .05$ . In particular, global self-esteem emerged as a significant linear predictor, with participants with high global self-esteem reporting greater perceived behavioural control,  $\beta = .22, t(124) = 2.21, p = .03, d = 0.40$ . Moreover, the inclusion of the two-way interaction terms at step 3 significantly increased the amount of variance accounted for by the model,  $\Delta F(3, 118) = 2.76, p = .05, \Delta R^2 = .06$ . Critically, the interaction between condition and global self-esteem emerged as a significant linear predictor,  $\beta = -.36, t(124) = -2.68, p = .01, d = -0.48$ . Furthermore, the interaction between condition and contingent self-esteem emerged as a marginally significant predictor,  $\beta = -.27, t(124) = -1.80, p = .07, d = -0.33$ . Entering the three-way interaction term at step 4 did not significantly increase the amount of variance accounted for by the model,  $\Delta F(1, 117) = 0.57, p = .45, \Delta R^2 = .003$ .

In order to further explore the significant interaction effect between condition and global self-esteem for perceived behavioural control, simple slopes analysis was conducted (Aiken & West, 1991). Perceived behavioural control was regressed onto condition for those with low (1 *SD* below the mean), mean and high (1 *SD* above the mean) global self-esteem scores. Contingent self-esteem scores were fixed to the mean value (0) for the analysis. The simple slopes analyses revealed a positive association between condition and perceived behavioural control scores for those with low levels of global self-esteem,  $\beta = .18$ ,  $t(124) = 1.48$ ,  $p = .14$ ,  $d = 0.27$ , with a trend for those in the self-affirmation condition to report greater perceptions of behavioural control towards reducing alcohol consumption. There was a negligible association between condition and perceived behavioural control scores for those with mean levels of global self-esteem,  $\beta = -.01$ ,  $t(123) = -.07$ ,  $p = .95$ ,  $d = -0.01$ . Furthermore, the simple slopes analyses revealed a negative association between condition and perceived behavioural control scores for those with high global self-esteem,  $\beta = -.19$ ,  $t(123) = -1.50$ ,  $p = .14$ ,  $d = -0.21$ , with a trend for those in the self-affirmation condition to report lower perceptions of behavioural control towards reducing alcohol consumption.

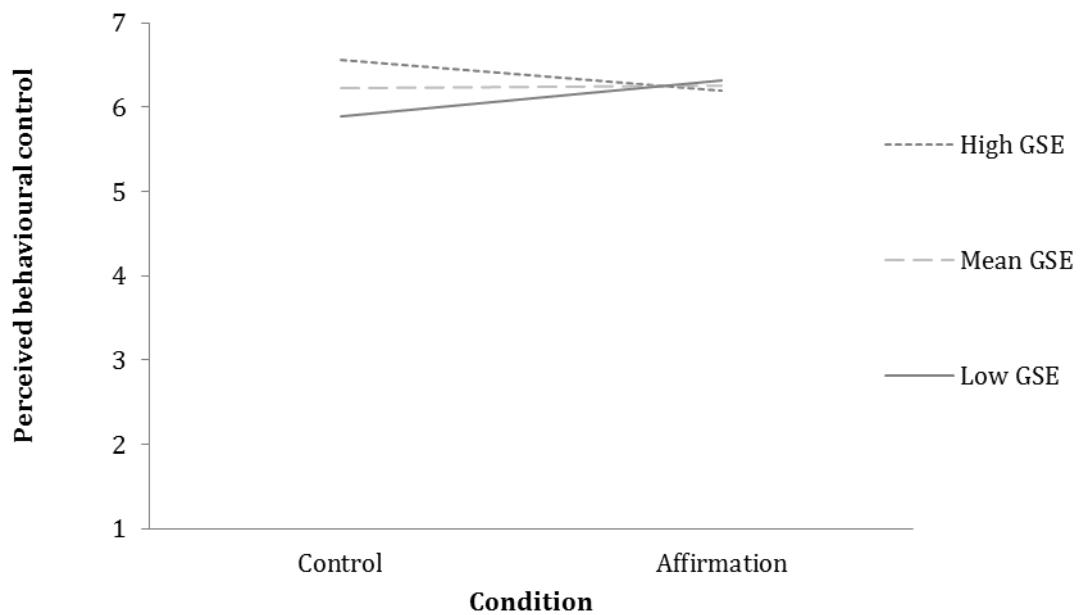
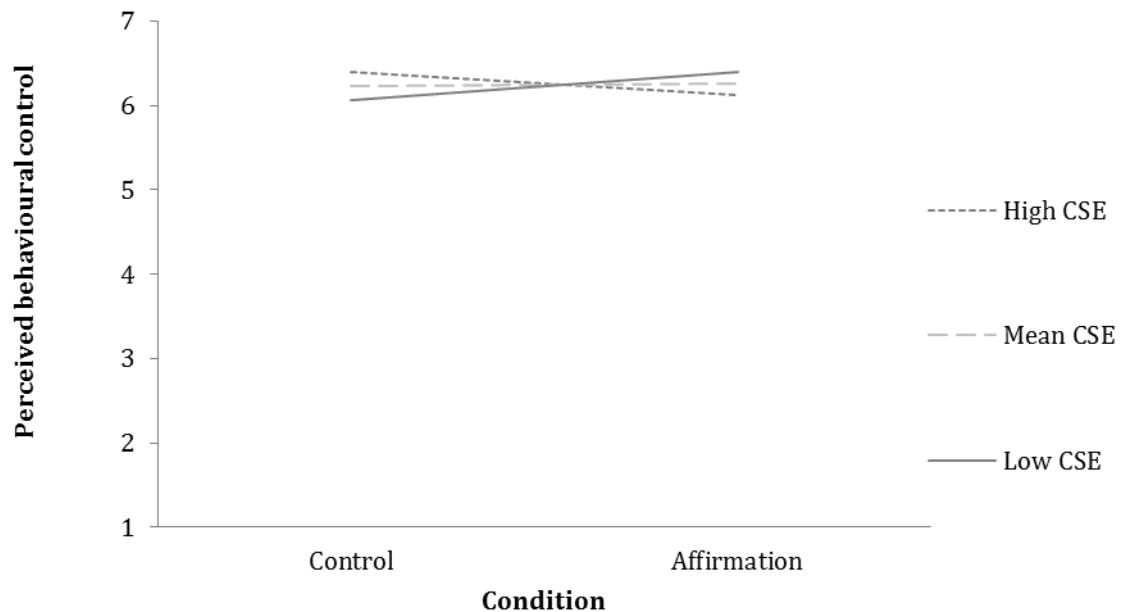


Figure 6. Perceived behavioural control regressed onto condition for individuals with low, mean and high levels of global self-esteem (GSE).

In order to further explore the marginally significant interaction effect between condition and contingent self-esteem for perceived behavioural control, simple slopes analysis was conducted (Aiken & West, 1991). Perceived behavioural control was regressed onto condition for those with low (1 *SD* below the mean), mean and high (1 *SD* above the mean) global self-esteem scores. Global self-esteem scores were fixed to the mean value (0) for the analysis. The simple slopes analyses revealed a small positive association between condition and perceived behavioural control scores for those with low levels of contingent self-esteem,  $\beta = .06$ ,  $t(124) = .42$ ,  $p = .67$ ,  $d = 0.08$ , with a trend for those in the self-affirmation condition to report greater perceptions of behavioural control towards reducing alcohol consumption. There was a negligible association between condition and perceived behavioural control scores for those with mean levels of contingent self-esteem,  $\beta = -.01$ ,  $t(124) = -.07$ ,  $p = .95$ ,  $d = -0.01$ . There was a small negative association for those with high contingent self-esteem,  $\beta = -.07$ ,

$t(124) = -.53, p = .60, d = -0.08$ , with a trend for those in the self-affirmation condition to report lower perceptions of behavioural control towards reducing alcohol consumption.



*Figure 7.* Perceived behavioural control regressed onto condition for individuals with low, mean and high levels of contingent self-esteem (CSE).

### Predicting behavioural outcomes

A hierarchical multiple regression analysis was carried out to determine the effect of the self-affirmation manipulation, the self-esteem aspects and the interaction between these variables on alcohol consumption at follow-up. Baseline alcohol consumption was entered at step 1, in order to control for any baseline differences in alcohol consumption, condition (dummy coded; control condition = 0, affirmation condition = 1) was entered at step 2, mean-centred global self-esteem and contingent self-esteem were entered at step 3, the two-way interaction terms between condition, global self-esteem and contingent self-esteem were entered at step 4, and the three-way interaction

term between condition, global self-esteem and contingent self-esteem was entered at step 5. The resultant regressions are summarised below in Table 9.

Table 9.

*Summary of Hierarchical Multiple Regression Analysis Predicting Alcohol Consumption at Follow-up*

Variables entered	Alcohol consumption at follow-up				
	Step 1	Step 2	Step 3	Step 4	Step 5
	$\beta$	$\beta$	$\beta$	$\beta$	$\beta$
Alcohol consumption (at baseline)	.67***	.66***	.65***	.62***	.63***
Condition		.06	.07	.07	.01
Global self-esteem (GSE)			.04	-.16	-.19
Contingent self-esteem (CSE)			.07	-.10	-.17
Condition X GSE				.26*	.29*
Condition X CSE				.20	.27
GSE X CSE				.11	.24*
Condition X GSE X CSE					-.20
$R^2$	.44	.45	.45	.48	.50
<i>Model F</i>	75.65***	37.96***	18.82***	11.93***	11.00***
$\Delta R^2$		.00	.00	.03	.02
$\Delta F$		.59	.27	1.95	2.81

\* $p < .05$ , \*\*\* $p < .001$

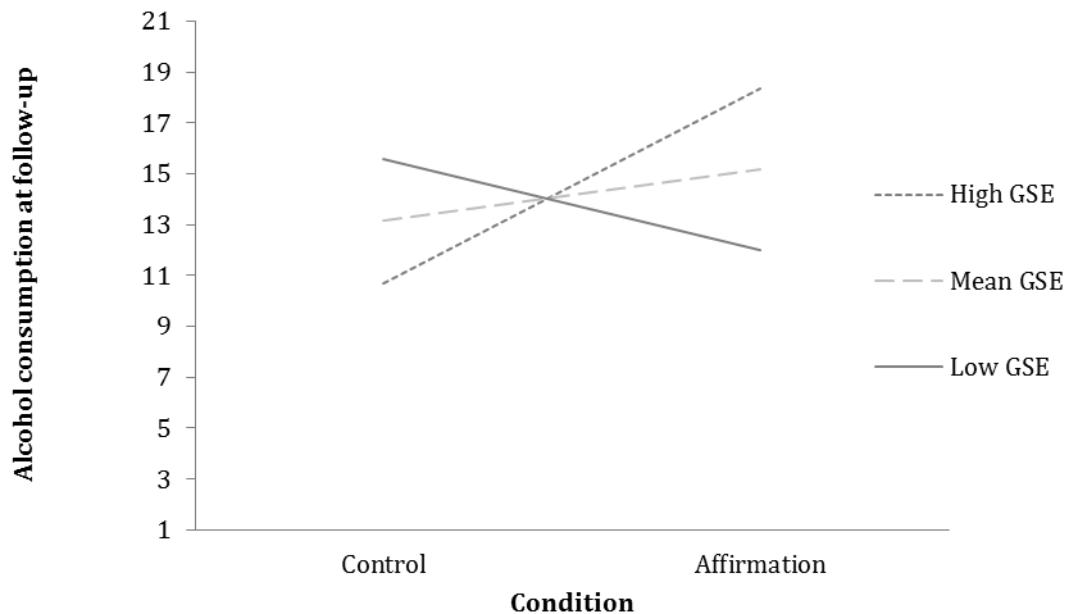
Baseline alcohol consumption, entered at step 1, significantly predicted participants' alcohol consumption at follow-up,  $F(1, 95) = 75.66$ ,  $p = .001$ ,  $R^2 = .44$ ,



with a strong positive association between alcohol consumption at baseline and alcohol consumption at follow-up,  $\beta = .67$ ,  $t(96) = 8.69$ ,  $p = .001$ ,  $d = 1.77$ . Entering condition at step 2, did not significantly increase the amount of variance accounted for by the model,  $\Delta F(1, 94) = 0.60$   $p = .44$ ,  $\Delta R^2 = .01$ , nor did the inclusion of the self-esteem aspects at step 3,  $\Delta F(2, 92) = 0.27$   $p = .76$ ,  $\Delta R^2 = .01$ . While the inclusion of the two-way interaction terms at step 4 did not significantly increase the overall variance accounted for by the model,  $\Delta F(3, 89) = 1.95$   $p = .13$ ,  $\Delta R^2 = .03$ , the interaction term between condition and global self-esteem emerged as a significant linear predictor,  $\beta = .26$ ,  $t(92) = 2.05$ ,  $p = .04$ ,  $d = 0.43$ . The inclusion of the three-way interaction term at step 5 did not increase the amount of variance explained by the model,  $\Delta F(1, 88) = 2.81$   $p = .10$ ,  $\Delta R^2 = .02$ .

In order to further explore the significant interaction effect between condition and global self-esteem, simple slopes analysis was conducted (Aiken & West, 1991). Alcohol consumption at follow-up was regressed onto condition for those with low (1 *SD* below the mean), mean and high (1 *SD* above the mean) global self-esteem scores. Contingent self-esteem scores were fixed to the mean value (0) as was baseline alcohol consumption. The simple slopes analyses revealed a negative association between condition and alcohol consumption at follow-up for those with low levels of global self-esteem,  $\beta = -.08$ ,  $t(96) = -.68$ ,  $p = .50$ ,  $d = -0.13$ , with a trend for those in the self-affirmation condition to report lower levels of alcohol consumption at follow-up. There was a small positive association between condition and behaviour at follow-up for those with mean levels of global self-esteem,  $\beta = .06$ ,  $t(96) = .77$ ,  $p = .44$ ,  $d = 0.16$ , with a trend for those in the self-affirmation condition to report higher levels of alcohol consumption at follow-up. Moreover, there was a larger positive association between condition on behaviour at follow-up for those with high levels of global self-esteem,  $\beta =$

.16,  $t(96) = 1.58$ ,  $p = .12$ ,  $d = 0.32$ , with a trend for those in the self-affirmation condition to report higher levels of alcohol consumption at follow-up.



*Figure 8.* Alcohol consumption at follow-up regressed onto condition for individuals with low, mean and high levels of global self-esteem (GSE).

## Discussion

The present study found partial support for the hypotheses that global self-esteem and contingent self-esteem would moderate the efficacy of a self-affirmation manipulation at promoting open processing of a health-risk message detailing the risks of alcohol consumption.

More specifically, the research findings provided some support for the hypothesis that global self-esteem would moderate self-affirmation effects on outcomes. In particular, for individuals with high global self-esteem, there was a trend for those in the self-affirmation condition to report lower levels of perceived behavioural control, relative to their counterparts in the control condition. By contrast, there was a trend for

self-affirmed individuals low in global self-esteem to report higher levels of perceived behavioural control, compared to their non-affirmed counterparts. This latter finding is broadly in line with the findings reported in Study 1 (Chapter 2). However, Study 1 found that global self-esteem moderated the impact of self-affirmation effects on a different set of outcome variables: attitudes, intentions and message derogation.

One potential reason for the differences in outcomes between the current study and Study 1 may be related to the particular health-behaviour under investigation. Whilst Study 1 focused on the moderating impact of global self-esteem on self-affirmation effects in relation to increasing uptake of a behaviour (exercise), the current study was concerned with the moderating impact of global self-esteem on self-affirmation in relation to reducing performance of a behaviour (alcohol consumption). Consequently, it is possible that the moderating impact of global self-esteem on specific cognitive outcome variables differs depending on the nature of the health behaviour under investigation.

Furthermore, the current study found evidence that global self-esteem moderated the impact of the self-affirmation manipulation on behaviour at follow-up. Specifically, there was a trend for self-affirmed individuals with low global self-esteem to consume less alcohol at follow-up, compared to their non-affirmed counterparts. By contrast, self-affirmed individuals with mean or high global self-esteem showed a trend to consume more alcohol at follow-up, relative to their counterparts in the control condition. As far as the author is aware, this is the first study to demonstrate that the moderating impact of global self-esteem on self-affirmation could be extended to behavioural effects.

Collectively, these findings contribute to research suggesting that any benefits of self-affirmation might be most apparent for individuals with low global self-esteem

(Study 1; Spencer, Fein & Lomore, 2001). As these individuals are typically the most likely to engage in health-detrimental behaviours (Stinson et al., 2008) and be more resistant to personally relevant health-risk information (e.g., Holland, Meertens & Van Vugt, 2002), these findings are promising from a health promotion perspective.

Furthermore, the findings of the current study suggest that self-affirmation has the potential to be detrimental for individuals high in global self-esteem. One reason for this may be that the self-affirmation manipulation resulted in overinflated positive self-feelings amongst these individuals, which - in turn – may have lead them to feel less vulnerable to the risks outlined in the health-risk message. Indeed, previous research has linked high levels of self-esteem to minimised perceptions of personal risk (Gerrard, Gibbons, Reis-Bergan & Russell, 2000). To the best of the author's knowledge, this is the first study to demonstrate any impact of self-affirmation for individuals high in global self-esteem. These findings suggest that caution should be exercised before rolling out self-affirmation manipulations at population level without taking into account individual difference variables.

With regard to contingent self-esteem, the study provided some, limited evidence supporting the prediction that contingent self-esteem would moderate self-affirmation effects, insofar as contingent self-esteem marginally moderated the effects of the self-affirmation manipulation on perceived behavioural control. Thus, there was a trend for individuals with low levels of contingent self-esteem to report greater perceptions of behavioural control in relation to reducing their alcohol consumption, compared to their non-affirmed counterparts. This finding is consistent with the research findings reported in Chapter 3, which found that self-affirmed individuals with low levels of contingent self-esteem reported more positive attitudes and perceptions of behavioural control, compared to their non-affirmed counterparts. It is noteworthy that

neither the current study, nor that reported in Chapter 3 revealed any evidence that individuals with high contingent self-esteem reported less defensive processing as a result of self-affirmation. Indeed, in the present study, there was a trend for self-affirmed individuals with high contingent self-esteem to report lower levels of perceived behavioural control, compared to their non-affirmed counterparts. This is in line with the finding of the study reported in Chapter 3, that self-affirmed individuals with high contingent self-esteem had marginally less positive attitudes towards increasing their exercise behaviour, compared to their non-affirmed counterparts.

The fact that contingent self-esteem moderated the effects of a kindness-based self-affirmation manipulation in the current study suggests that the pattern of findings reported in Chapter 3 cannot be solely attributed to the fact that a value-based self-affirmation manipulation is particularly ill-suited to those with high contingent self-esteem. However, it is plausible that alternative self-affirmation manipulations could be effective at reducing defensive processing for individuals high in contingent self-esteem. For example, recent research has demonstrated that spending time on one's Facebook page may serve as a self-affirmation manipulation (Toma, 2010; Tomo & Hancock, 2013). Given that the self-worth of individuals with high levels of contingent self-esteem is dependent on external validation, this type of self-affirmation manipulation might be more effective at self-affirming this group of individuals, compared to the private and introspective tasks that characterise values-based and kindness-based self-affirmation manipulations.

Alternatively, it is possible that the nature of self-affirmation manipulations as a whole might render them less effective for individuals with highly contingent self-esteem. As suggested in the introduction of the current paper, the main goal of any self-affirmation manipulation is to provide an individual with the opportunity to reflect on

positive self-resources (Cohen & Sherman, 2014). Thus, as individuals with high contingent self-esteem are dependent on validation from other people in order to feel worthy, simply considering positive aspects of the self might not be self-affirming. Indeed, considering that there is a link between high contingent self-esteem and a variety of negative health outcomes (e.g., Bos, Huijding, Muris, Vogel & Biesheuvel, 2001; Deci & Ryan, 1995; Soenens & Duriez, 2012), it is important to explore how to promote open processing of personally relevant risk information amongst individuals with high contingent self-esteem.

There are some limitations to the current study. Firstly, the study relied on self-report measures of alcohol consumption, where the existing negative stigma of excessive alcohol consumption, particularly for women (Blume, 1991), could potentially be problematic. However, previous research has suggested that using self-report measures of alcohol consumption is an equally valid way of measuring alcohol consumption as using biomarkers (Babor, Steinberg, Anton & Boca, 2000; Del Boca & Darkes, 2003). Secondly, due to the nature of the health-risk information presented, the current sample consisted solely of women, influencing the generalisability of the research findings.

In sum, the present paper represents the first test of the moderating role of global self-esteem and contingent self-esteem on the effectiveness of a kindness affirmation manipulation at promoting openness to information detailing the negative consequences of alcohol consumption. Findings supported the prediction that global self-esteem would moderate the effectiveness of self-affirmation in this context, with any benefit of the manipulation being apparent only for those low in global self-esteem. Critically, findings also revealed that self-affirmation has the potential to be counterproductive for individuals high in global self-esteem. Furthermore, this study provided some, limited,

support for the prediction that the self-affirmation would be most efficient at reducing defensive processing for those low in contingent self-esteem. Collectively, these findings further attest to the importance of considering aspects of self-esteem as potential moderators of self-affirmation effects.

## Chapter 6: Discussion

### Overview of background literature and research aims

Much research has documented the potential for self-affirmation to encourage open processing of personally relevant health-risk information, as indicated on both cognitive and behavioural outcome variables (e.g., Armitage et al., 2008; Cooke et al., 2014; Epton & Harris, 2008; Harris et al., 2007; Jessop et al., 2009).

Critically, however, the majority of such research has failed to consider the role of potential moderating variables on the effectiveness of self-affirmation on outcomes. A particular limitation to the research in this area is the paucity of research exploring dispositional moderators of self-affirmation effects. One set of dispositional variables that have been discussed as potential moderators of self-affirmation effects are those relating to self-regard (Harris & Epton, 2010). Therefore, the aim of the current programme of research was to explore aspects of self-regard as potential moderators of the effectiveness of self-affirmation at promoting open processing of personally relevant health-risk information.

### Summary of Findings

#### *Study 1 (Chapter 2): The moderating impact of self-esteem on self-affirmation effects*

The first study presented in this thesis demonstrated that global self-esteem moderated the effectiveness of a self-affirmation at promoting open processing of a health-risk message detailing the dangers of insufficient exercise. Specifically, the results revealed that individuals with low global self-esteem reported more positive attitudes and intentions towards increasing exercise, together with less message derogation, relative to their counterparts in the control condition. By contrast, there were no effects of the self-affirmation manipulation on outcomes for individuals with high levels of global



self-esteem. This study provided preliminary evidence that global self-esteem might moderate self-affirmation effects in a health-related context.

***Study 2 (Chapter 3): Self-regard and self-affirmation: evidence that contingent self-esteem moderates self-affirmation effects***

The second study presented in this thesis further investigated dispositional moderators of the effectiveness of self-affirmation at facilitating open processing of personally relevant health-risk information about exercise. This study extended the design of the first study by exploring the moderating impact of the following aspects of self-regard on self-affirmation effects: global self-esteem, contingent self-esteem, self-esteem instability, implicit self-esteem, self-concept clarity and narcissism. The findings revealed that contingent self-esteem moderated self-affirmation effects. Specifically, self-affirmed individuals with low contingent self-esteem reported more positive attitudes and perceptions of behavioural control in relation to increasing their exercise behaviour, relative to their counterparts in the control condition. There was no evidence that self-affirmation promoted open processing of the health-risk message for those high in contingent self-esteem; indeed, self-affirmed individuals with high contingent self-esteem reported marginally less positive attitudes towards increasing their exercise behaviour, compared to their non-affirmed counterparts.

***Study 3 (Chapter 4): Exploring the potential moderating impact of primed contingent self-esteem on self-affirmation effects***

The final empirical study reported in this thesis further explored the potential for contingent self-esteem to moderate self-affirmation effects, by investigating whether a contingent self-esteem prime would influence the potential of self-affirmation to

encourage open processing of health-risk information detailing the risks of insufficient exercise. Findings revealed no evidence that primed contingent self-esteem moderated the effectiveness of self-affirmation on cognitive or behavioural outcomes. There was, however, a main effect of the contingent self-esteem prime on some outcomes.

Specifically, the results revealed that individuals primed with high contingent self-esteem reported marginally more positive attitudes, and significantly more positive intentions, towards increasing their exercise behaviour compared to individuals in the low contingent self-esteem prime conditions. Results also revealed a marginally significant main effect of the self-affirmation manipulation on attitudes towards increasing level of exercise; unexpectedly, self-affirmed participants reported less positive attitudes compared to their non-affirmed counterparts. Furthermore, there was a significant main effect of the self-affirmation manipulation on behaviour, with self-affirmed individuals reporting higher levels of exercise behaviour at follow-up, compared to those in no-affirmation conditions.

***Study 4 (Chapter 5): Exploring the role of global self-esteem and contingent self-esteem as moderators of self-affirmation effects***

The goal of the third empirical study reported in this thesis was to investigate whether the moderating roles of global self-esteem and contingent self-esteem on the effectiveness of self-affirmation at promoting open processing of a health-risk message would hold (i) when using a different self-affirmation manipulation (the kindness affirmation manipulation [Reed & Aspinwall, 1998]) and (ii) across a different behavioural domain (alcohol consumption). Results revealed some evidence that global self-esteem moderated the effects of the self-affirmation manipulation on cognitive and behavioural outcomes. Specifically, there was a trend for self-affirmed individuals with

low global self-esteem to report greater perceptions of behavioural control regarding reducing their alcohol intake, and to consume less alcohol at follow-up, compared to their non-affirmed counterparts. By contrast, there was a trend for self-affirmed individuals with high global self-esteem to report lower perceptions of behavioural control regarding reducing their alcohol intake, and to consume more alcohol at follow-up, compared to their counterparts in the control condition.

Furthermore, this study found a marginal moderating effect of contingent self-esteem on perceptions of behavioural control. Specifically, there was a trend for self-affirmed individuals with low contingent self-esteem to report greater perceptions of behavioural control in relation to reducing their alcohol consumption, compared to their counterparts in the control condition. By contrast, there was a trend for self-affirmed individuals with high levels of contingent self-esteem to report lower perceptions of behavioural control in relation to reducing their alcohol consumption, compared to their counterparts in the control condition.

### **Theoretical and practical implications of the research findings**

The most important contribution of this thesis is the finding that aspects of self-esteem can moderate the effectiveness of self-affirmation at promoting open processing of personally relevant health-risk information. Specifically, the research findings presented provide some support for the position that global self-esteem and contingent self-esteem may be important moderators of self-affirmation effects in such contexts. However, these findings should be interpreted with a certain degree of caution given that the amount of variance accounted for by the moderating effects of these dispositional variables was relatively small. Nonetheless, although these effects were not consistently replicated across all studies in the research programme, these findings contribute to the

existing literature by highlighting the importance of recognising that individuals may respond differently to self-affirmation manipulations as a function of dispositional aspects of self-regard. This section discusses the implications of the findings that (i) global self-esteem and (ii) contingent self-esteem moderate self-affirmation effects for theory and practice respectively. It also discusses the implications of the apparent lack of support for main effects of self-affirmation on outcomes for theory and practice.

***Global self-esteem as a dispositional moderator of self-affirmation effects***

The studies reported in Chapters 2 and 5 both revealed the moderating potential of global self-esteem on self-affirmation effects in health related contexts for both cognitive and behavioural outcomes. Critically, the findings of these studies found that the effects of self-affirmation were most apparent for individuals low in global self-esteem. There was also some evidence suggesting self-affirmation can lead to potential backfire effects for individuals with high global self-esteem.

***Global self-esteem moderates self-affirmation effects: Implications for theory***

The results reported in Chapters 2 and 5 are consistent with the findings of Spencer, Fein & Lomore (2001), who similarly found that individuals with low global self-esteem benefitted the most from self-affirmation, in terms of reduced defensive processing of threatening information. Collectively, these findings highlight the importance of recognising that individuals may respond differently to self-affirmation manipulations as a function of global self-esteem. Previous research that has explored the impact of global self-esteem on the effectiveness of self-affirmation has typically explored global self-esteem as a mediator of self-affirmation effects, with inconclusive findings (McQueen & Klein, 2006; Steele & Liu, 1983; Sherman & Kim, 2005). The

findings of the present thesis, together with those of Spencer et al. (2001), suggest that it may be profitable for future research to explore the *moderating* role of global self-esteem on self-affirmation effects.

Furthermore, the findings support the hypothesis that individuals with low global self-esteem may be more reliant on self-affirmation to maintain feelings of global self-integrity when faced with threatening information, as they do not have automatic access to a wide range of positive self-resources (e.g., Pietersma & Dijkstra, 2012; Sherman & Cohen, 2006). By contrast, individuals with high global self-esteem may already have an extensive range of positive self-resources available to reflect on to boost feelings of self-integrity when faced with threatening information, independent of a self-affirmation manipulation. Therefore, a self-affirmation manipulation may have more apparent effects for individuals with low global self-esteem. Interestingly, the findings of the present thesis, and that of Spencer et al. (2001), suggest that self-affirmation manipulations can even out any disparities between individuals with low and high global self-esteem in terms of their capacity to process personally relevant and threatening information openly.

However, this reasoning does not directly explain why self-affirmation appeared to backfire for individuals with high global self-esteem. One potential explanation for this finding could be that individuals who already possess a wide range of positive self-resources may respond to self-affirmation by feeling overly confident and self-assured, which may result in these individuals feeling less threatened by the health-risk information. This represents an interesting area for future research; however it is noteworthy that the tendency for self-affirmation to backfire for individuals with high global self-esteem was only found for one of the outcome variables in one study.

***Global self-esteem moderates self-affirmation effects: Implications for practice***

The goal of much self-affirmation research in health-related domains is to explore whether self-affirmation manipulations might be profitably utilised as interventions to reduce defensive processing of health-promotion material. In particular, considering that low global self-esteem has been associated with a higher risk of engaging in health-detrimental behaviours, it is encouraging from a health promotion perspective that the self-affirmation manipulations reported in Chapters 2 and 5 were most effective for individuals low in global self-esteem, as they may be at greatest risk (Trzesniewski et al., 2006).

However, the research findings reported in this thesis suggest that self-affirmation can be ineffective, or even counterproductive, for individuals with high global self-esteem. Such findings highlight the importance of conducting future research to explore which dispositional variables influence the effectiveness of self-affirmation manipulations. They also attest to the importance of understanding boundary conditions to the effectiveness of self-affirmation manipulations at increasing openness to personally relevant health-risk information before such manipulations are implemented at population level.

***Contingent self-esteem as a dispositional moderator of self-affirmation effects***

Taken together, the studies reported in Chapters 3 and 5 found some preliminary evidence suggesting that contingent self-esteem also moderated the effectiveness of self-affirmation at promoting open processing of health-risk information. Specifically, the study presented in Chapter 3 found that only individuals with low contingent self-esteem reported more positive outcomes as a result of self-affirmation. Similarly, the

study reported in Chapter 5 found a trend for individuals with low contingent self-esteem to benefit the most from self-affirmation. By contrast, both studies found some evidence suggesting that self-affirmation is either ineffective, or can have backfire effects, for individuals with high contingent self-esteem. Interestingly, the moderating role of contingent self-esteem was not replicated when experimentally activated contingent self-esteem was explored as a moderator of self-affirmation effects (Chapter 4). To the best of the author's knowledge, the studies reported in Chapters 3 and 5 are the first studies to find evidence that contingent self-esteem moderates the effectiveness of self-affirmation on outcomes.

***Contingent self-esteem moderates self-affirmation effects: Implications for theory***

Similar to the studies in this thesis that found that global self-esteem moderated self-affirmation effects, the studies presented in Chapters 3 and 5 further attest to the importance of exploring the potential moderating impact of dispositional aspects of self-regard on self-affirmation effects. Moreover, the studies presented in Chapters 3 and 5 demonstrate the importance of recognising that self-esteem is a multi-dimensional construct, by revealing that a particular aspect of self-esteem, contingent self-esteem, moderated self-affirmation effects.

The study reported in Chapter 4 revealed no moderating impact of primed levels of contingent self-esteem on self-affirmation effects. Given the findings reported in Chapters 3 and 5 discussed above, this was unexpected. Nevertheless, as discussed in Chapter 4, there may be significant qualitative differences between dispositional and primed level of contingent self-esteem. For example, high levels of contingent self-esteem may be the result of repeated experiences that has lead an individual to develop

feelings of self-worth that are dependent on external factors, such as other people's approval or performance outcomes. This view of the self that has developed over time could potentially be difficult to replicate with a priming manipulation. Thus, dispositional level of contingent self-esteem and primed levels of contingent self-esteem may not be comparable in terms of their capacity to moderate the impact of self-affirmation on outcomes. Indeed, perhaps the contingent self-esteem prime did not produce changes in contingent self-esteem that were sufficiently robust to replicate the moderating impact of dispositional contingent self-esteem on self-affirmation effects and thereby failed to influence the effect of self-affirmation on these individuals.

***Contingent self-esteem moderates self-affirmation effects: Implications for practice***

A key implication of the findings reported in Chapters 3 and 5 arises from the fact that individuals *high* in contingent self-esteem benefitted the least from self-affirmation. Specifically, the findings of the studies reported in Chapters 3 and 5 suggest that self-affirmation is either of no benefit, or counterproductive, for individuals with high contingent self-esteem. This is concerning from a health-promotion perspective, as previous research has found that these individuals may stand a greater risk of engaging in health-detrimental behaviours (e.g., Bos, Huijding, Muris, Vogel & Biesheuvel, 2001; Deci & Ryan, 1995; Soenens & Duriez, 2012). Furthermore, these findings contrast with previous findings suggesting that self-affirmation manipulations frequently have the most pronounced effects on individuals who are at highest risk. For example, Harris & Napper (2005) demonstrated that a self-affirmation manipulation aimed at promoting open processing of alcohol-related risk information was most apparent amongst participants who were defined as heavy drinkers.



One potential explanation as to why individuals with high contingent self-esteem did not benefit from self-affirmation could be related to the types of self-affirmation manipulations used. The studies presented in this thesis utilised either a value-based affirmation manipulation or a kindness-based affirmation manipulation. These manipulations are designed to make the individual reflect on either personally important values or previous acts of kindness. Critically, both these manipulations are structured to be private tasks that do not provide the individual with external validation. Arguably, as individuals with high contingent self-esteem are dependent on external validation in order uphold feelings of self-worth, it may be the case that privately reflecting on positive aspects of the self is not an effective way of self-affirming this group. Instead, they may be more likely to benefit from a self-affirmation manipulation that focuses on external factors, such as social approval or performance outcomes (Toma, 2010; Toma & Hancock, 2013).

Critically, the finding that self-affirmation manipulations may backfire for individuals with high contingent self-esteem adds further support to the contention that caution should be exercised with regard to administering self-affirmation manipulations as health promotion material for the general public. Given the research findings of the current thesis, it would seem important for future research to continue to explore how specific dispositional factors, such as high contingent self-esteem, may cause self-affirmation manipulations to backfire for some recipients.

***Lack of evidence for main effects of self-affirmation for cognitive and behavioural outcomes***

In line with the predictions of self-affirmation theory and the findings of previous published literature in this area, one might expect self-affirmation to have significant

main effects on outcomes in terms of promoting reduced defensive responses to threatening information (Harris & Epton, 2009; Steele, 1988;). Therefore, it was surprising that the studies presented in this thesis found only some limited support regarding the general capacity for self-affirmation to reduce such defensive responses. Specifically, the study reported in Chapter 2 found only a marginally significant main effect of self-affirmation on intention, with self-affirmed participants reporting more positive intentions towards increasing their exercise behaviour. The study presented in Chapter 3 found only a significant main effect of self-affirmation on perceived behavioural control, with self-affirmed participants reporting greater perceptions of behavioural control regarding increasing their exercise behaviour. The findings reported in Chapter 4 revealed that self-affirmed individuals reported marginally *less* positive attitudes towards increasing their exercise behaviour, but significantly higher levels of exercise behaviour at follow-up. Lastly, the study presented in Chapter 5 revealed no significant main effects of self-affirmation on any outcomes.

***Lack of evidence for main effects of self-affirmation for cognitive and behavioural outcomes: Implications for theory***

The lack of main effects of self-affirmation on the majority of the outcome variables in the current thesis is inconsistent with previous research, which has frequently demonstrated the capacity for self-affirmation manipulations to promote open processing of personally relevant health-risk information (see Harris & Epton, 2010). The finding that self-affirmed individuals reported less positive attitudes towards increasing their exercise behaviour compared to individuals in the no-affirmation conditions reported in Chapter 4 is particularly surprising, considering that research has

previously documented the capacity for self-affirmation to promote positive attitudes to increasing one's exercise behaviour (Cooke et al., 2014; Jessop et al., 2014).

The findings of the current thesis call into question the assumption that self-affirmation manipulations can be expected to routinely promote open processing of personally relevant health-risk information. However, as discussed in the introductory chapter, it has previously been recognised that self-affirmation manipulations generate inconsistent findings across cognitive outcomes (Armitage et al. 2008; Harris & Napper, 2005; van Koningsbruggen and Das, 2009). Furthermore, it is possible that there exist other unpublished studies, which have similarly failed to find main effects of self-affirmation on outcomes; the so-called “file-drawer” effect in published research (Cumming, 2014).

It is notable that previous studies documenting the impact of moderator variables on self-affirmation effects have also have sometimes failed to find main effects of self-affirmation on outcomes. For example, Harris & Napper (2005) found no main effect of a self-affirmation manipulation aimed at promoting openness to a health-risk message detailing the risks of alcohol consumption. However, individual level of risk was found to moderate the effects of self-affirmation on outcomes, insofar as individuals who were at greatest risk (i.e., those who consumed the greatest amount of alcohol) benefited the most from self-affirmation, as indicated by increased acceptance of the health-risk message amongst these participants, compared to their non-affirmed counterparts.

Critically, if the studies in this thesis had not taken into account the potential moderating impact of aspects of self-regard, it would have been concluded that the self-affirmation manipulations had failed to reduce defensive processing as indicated on the majority of the outcomes for all of the participants. This demonstrates the importance of taking into account potential moderators of self-affirmation effects. Indeed, it seems

plausible that previous studies that have omitted to explore the moderating impact of aspects of self-regard may have mistakenly concluded that self-affirmation had no effect on outcome variables.

***Lack of evidence for main effects of self-affirmation for cognitive and behavioural outcomes: Implications for practice***

The main practical implication relating to the lack of significant main effects of self-affirmation on outcomes concerns the integration of self-affirmation manipulations into health promotion material. The findings of this thesis suggest that self-affirmation manipulations, although sometimes effective, have a tendency to fail and may even cause detrimental effects for some individuals. Thus, on the basis of the findings of the current thesis, it would not be advised to administer self-affirmation manipulations as a part of health promotion material across the general population.

**Limitations of the current programme of research**

There are a number of potential limitations to the studies forming the current programme of research. Whilst some of these have already been mentioned in the previous sections of the current chapter and the discussion sections of the various empirical chapters, below three particular limitations will be discussed in more detail.

***Reliance on self-report measures***

The current programme of research relied on self-report measures to assess behavioural outcomes throughout all studies. Self-report measures of behaviour can be seen as less reliable than objective measures as they are vulnerable to the participant's introspection, honesty and correct recollection of their past behaviours (Christiansen, 2002). Thus, the

findings of the current research programme would be strengthened if they were replicated using objective measures of both exercise behaviour and alcohol consumption. However, there is much evidence to support the use of self-report measures to assess health behaviours as a valid way of assessing health outcomes and such measures have even been found to be reliable enough to be used as predictors of mortality (Bjorner et al., 1996). Previous research has found that the use of self-report measures is a reliable way of assessing both physical activity (Miller, Freedson & Kline, 1994) and alcohol consumption (Babor, Steinberg, Anton & Boca, 2000; Del Boca & Darkes, 2003). Furthermore, it is noteworthy that the majority of self-affirmation research to date has relied on self-report measures to assess behavioural outcomes at follow-up, so this limitation is by no means unique to the studies presented in this thesis

All the studies in the current thesis also relied on self-report measures to assess cognitive outcome variables. There is concern that the validity of such self-report measures might be compromised by participants' susceptibility for social desirability bias and demand characteristics (Greenwald & Banaji, 1995). Thus, an alternative way of assessing these constructs that circumvent issues associated with explicit measures would be to use implicit measures of cognitive outcomes (Fazio & Olson, 2003). It has been found that implicit measures are less likely to cause report biases as the participant's response is not limited to introspection, but relies on automatic responses made outside of conscious awareness (Greenwald, McGhee & Schwartz, 1998, but see also Gawronski, Hofmann & Wilbur, 2006).

The above notwithstanding, one benefit of using self-report measures to assess behavioural and cognitive outcomes is the fact that it allowed for the studies to be conducted online. Previous research suggest that, as well as being more cost and time efficient for both participants and experimenter, internet-based questionnaire studies

create samples that are just as diverse and representative as traditional paper and pencil methods of collecting data (Gosling, Vazire, Srivastava & John, 2004). Furthermore, allowing participants to complete the self-report questionnaires online increases the range of participants that are able to take part in the study, which consequently enhances the generalisability of the research findings (Naglieri et al., 2004; Wright, 2005). Moreover, research has suggested that completing questionnaires online can reduce risk of demand characteristics and response bias (Davis, 1999).

### ***Measures of Global self-esteem and Contingent self-esteem***

A second limitation to the current research programme is the reliance throughout the empirical studies on the same measures to assess global self-esteem and contingent self-esteem. It is notable that there are other measures available to measure these constructs. All the studies in this thesis utilised the Rosenberg Self-esteem Scale to assess global self-esteem (Rosenberg, 1965). Other potential and widely applied measures of self-esteem include the feelings of inadequacy scale (Janis & Field, 1959) and the self-esteem inventory (Coppersmith, 1967). The decision to utilise the Rosenberg self-esteem scale was based on it being a relatively brief, one-dimensional measure of self-esteem. Furthermore, this scale is the most frequently applied measure of self-esteem and is often used as a standard against which newer self-esteem measures are evaluated (Blascovich & Tomaka, 1991). The studies in this thesis also exclusively utilised the Contingent Self-esteem Scale (Kernis & Goldman, 2006) to assess contingent self-esteem. This scale was selected on the basis that it is a well-established and relatively brief measure that captures general levels of contingent self-esteem. While there are other measures of contingent self-esteem available, the majority are designed to assess a

specific domain of contingent self-esteem, such as academic performance (e.g., Crocker & Luthanen, 2003).

The above notwithstanding, it would be informative for future research to explore whether the apparent moderating roles of global self-esteem and contingent self-esteem hold utilising other measures of these constructs. Furthermore, although global self-esteem and contingent self-esteem are typically measured using self-report measures, it may also be informative for future research to explore more objective ways of assessing these constructs.

### ***Generalisability of research findings***

A third limitation concerns the generalisability of the research findings. The majority of the participants in studies presented in Chapters 2, 3 and 4 were university students. It may be the case that university students' exercise habits differ to those of the general population.

Furthermore, all of the studies reported in this thesis used self-selection sampling procedures, which may limit the generalisability of the research findings. Arguably, people may have been more inclined to take part in the studies if they were particularly interested in exercise or alcohol respectively. As such, these individuals may have been more engaged with the health promotion materials and, possibly, more open to the advice given than would a randomly selected sample of the general population.

Lastly, it is notable that females were overrepresented in all of the studies of the current research programme. Previous research has suggested that there are gender differences in regard to both exercise behaviour and alcohol consumption, with males being more likely to exercise (e.g., Buckworth & Nigg, 2004) and to consume more

alcohol (e.g., Wilsnack, Wilsnack, Kristjanson, Vogeltanz-Holm & Gmel, 2009)) than females.

In sum, it would be advisable for future research to replicate the studies presented in this thesis using a more representative sample of the general public.

### ***Additional limitations***

It is notable that although global self-esteem emerged as a significant moderator of self-affirmation effects in the study presented in Chapter 2, the analyses revealed that the inclusion of the interaction term between self-affirmation and global self-esteem only accounted for a relatively small amount of the variance explained by the model. Similarly, in the study reported in Chapter 3, the amount of variance accounted for by the interaction between self-affirmation and contingent self-esteem was also relatively small. A further limitation is that in the studies presented in Chapters 2 and 3, participants were alternately allocated to conditions. Whilst it would have been preferable to use methods of random allocation, the online data collection software available to the author at the time precluded this.

### **Suggestions for future research**

In addition to the recommendation that the research presented in this thesis would benefit from the use of more objective measures of health behaviours and cognitions and from using a stratified sample of the general public, a number of more specific avenues for future research are outlined below.



***The need for ongoing exploration into aspects of self-regard as moderators of self-affirmation effects***

The current thesis provided evidence suggesting that global self-esteem and contingent self-esteem moderated the effectiveness of both a value-based affirmation manipulation and a kindness-based affirmation manipulation. It would be interesting for future research to explore whether these findings extend to other types of self-affirmation manipulations. Moreover, it would be of merit to investigate whether the current findings hold across other behavioural domains. For example, previous self-affirmation research has frequently explored the impact of self-affirmation in relation to reducing smoking (e.g., Harris et al., 2007) and caffeine consumption (e.g., Reed & Aspinwall, 1998). It would be interesting to see whether the moderating impact of global self-esteem and contingent self-esteem on the effectiveness of self-affirmation at promoting open processing of threatening information would extend to these domains.

It would also be informative for future studies to explore whether the moderating role of global self-esteem and contingent self-esteem would extend to different outcome variables. For example, it would be interesting to explore whether global and/or contingent self-esteem would moderate the effects of self-affirmation on attitudes when this construct was assessed using implicit measures (Cunningham, Preacher & Banaji, 2001). Furthermore, it may be informative to explore whether the apparent moderating impact of global self-esteem and/or contingent self-esteem holds for other implicit measures of openness to health-risk information. For example, previous research has used a lexical decision task to measure accessibility of a health-risk message (van Koningsbruggen, Das & Roskos-Ewoldsen, 2008) and a visual-dot-probe task to measure attentional bias when exposed to a health-risk message (Klein & Harris, 2009).

***Exploring the effectiveness of different self-affirmation manipulations for individuals high in contingent self-esteem***

As discussed previously, it is not encouraging from a health-promotion perspective that the present research revealed no benefit of self-affirmation for individuals high in contingent self-esteem, as these individuals may be most in need of intervention (e.g., Bos, Huijding, Muris, Vogel & Biesheuvel, 2001; Deci & Ryan, 1995; Soenens & Duriez, 2012). Therefore, it would be useful for future research to explore whether other types of self-affirmation manipulations may be more effective at boosting self-integrity for these individuals. As suggested in Chapter 3, perhaps a self-affirmation manipulation that is more focused on external validation would be more efficient for individuals with high contingent self-esteem. For example, previous research has demonstrated that spending time on one's Facebook page can be self-affirming (Toma, 2010; Toma & Hancock, 2013). This type of self-affirmation may be more effective at boosting global self-integrity for individuals with high contingent self-esteem, as it involves contemplating domains that may be particularly important to their sense of self-worth, such as social approval.

***The exploration of further moderators of self-affirmation effects***

Based on the findings of the current thesis, it seems important for future research to systematically explore the potential moderating impact of dispositional variables on the effectiveness of self-affirmation at promoting open processing of personally relevant health-risk information. Indeed, by continuing to explore factors that may potentially moderate self-affirmation effects, we can add to our understanding of the limitations to the effectiveness of self-affirmation theory. Some key contenders would seem to be the

Big Five (Gosling, Rentfrow & Swann, 1992), hostility (Barefoot, Dodge, Peterson, Dahlstrom & Williams, 1989), sensation seeking (Zuckerman, 1979) and impulsivity (Whiteside & Lynam, 2001).

### *Exploring associations between variables using different analyses*

It would also be of interest for future research to explore the relationship between the variables under investigation in the present programme of research using different analyses. In order to avoid the risk of a type 1 error, the present programme only looked at straightforward associations between aspects of self-regard, the self-affirmation manipulation and outcomes. However, it may be beneficial for future research to explore potential mediating pathways between these variables. Indeed, previous studies have found that anticipated regret mediated the effects of self-affirmation on behavioural intentions (e.g., van Koningsbruggen, Harris, Smits, Schuz, Scholz & Cooke, 2014).

## **Conclusion**

In sum, the research presented in this thesis has explored the moderating potential of aspects of self-regard on the effectiveness of self-affirmation at promoting open processing of personally relevant health-risk information. As far as the author is aware, these are the first studies to explore aspects of self-regard as potential moderators of self-affirmation effects in health-related contexts. Critically, the research findings demonstrate that global self-esteem and contingent self-esteem can moderate the capacity for self-affirmation to promote open processing of personally relevant health-risk information. Specifically, the results suggested that the potential of self-affirmation to promote open processing of such information is most apparent for individuals with

low global self-esteem or low contingent self-esteem. Indeed, if the present programme of research had been conducted without considering these potential moderators it would have been wrongly concluded that there were no effects of self-affirmation on the majority of the outcome variables. Thus, these findings highlight the need for future research to explore dispositional factors, such as aspects of self-regard, as potential moderators of self-affirmation effects.

Furthermore, the current programme of research found some evidence to suggest that self-affirmation manipulations may result in backfire effects for some recipients. This was particularly apparent for individuals with high levels of contingent self-esteem. There was also some limited evidence that it might also be an issue for those high in global self-esteem. These findings illustrate the need to exercise caution with regard to administering self-affirmation manipulations as an intervention at a population level, as it is possible that such an approach could result in detrimental health-related consequences for some recipients.

Based on the findings of this thesis, it would seem important for future research to continue to explore the moderating role of aspects of self-regard on the effectiveness of self-affirmation across different behavioural domains. This may help further the theoretical understanding of self-affirmation theory. Furthermore, it may advance our understanding of boundaries to the effectiveness of self-affirmation at promoting open processing of personally relevant health-risk information, with attendant implications for applications of self-affirmation in health promotion contexts.

## References

- Abraham, C., Sheeran, P., Spears, R., & Abrams, D. (1992). Health beliefs and promotion of HIV-preventive intentions among teenagers: A Scottish perspective. *Health Psychology, 11*, 363-370. doi: 10.1037/0278-6133.11.6.363
- Aiken, L. S., & West, S.G. (1991). *Multiple Regression: Testing and interpreting interactions*. London: Sage.
- Ajzen, I. (2002). Constructing a TpB Questionnaire: conceptual and methodological considerations. Retrieved 1<sup>st</sup> of August 2013 from <http://www.unibielefeld.de/ikg/zick/ajzen%20construction%20a%20tpb%20questionnaire.pdf>
- Ames, D. R., Rose, P., & Anderson, C. P. (2006). The NPI-16 as a short measure of narcissism. *Journal of Research in Personality, 40*, 440-450. doi: 10.1016/j.jrp.2005.03.002
- American Psychological Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition*. Arlington, VA: APA.
- Armitage, C. J., Harris, P. R., & Arden, M. A. (2011). Evidence that self-affirmation reduces alcohol consumption: Randomized exploratory trial with a new, brief means of self-affirming. *Health Psychology, 30*, 633-641. doi: 10.1037/a0023738
- Armitage, C. J., Harris, P. R., Hepton, G., & Napper, L. (2008). Self-affirmation increases acceptance of health-risk information among UK adult smokers with low socioeconomic status. *Psychology of Addictive Behaviours, 22*, 88-95. doi: 10.1037/0893-164X.22.1.88
- Armitage, C. J., & Rowe, R. (2011). Testing multiple means of self-affirmation. *British Journal of Psychology, 102*, 535-545. doi: 10.1111/j.2044-8295.2010.02014.x

- Aronson, J., Cohen, G., & Nail. P., R. (1999). Self-affirmation theory: An update and appraisal. In E. Harmon-Jones (Ed), *Cognitive dissonance: Progress on a pivotal theory in social psychology*. Science conference series, 127-147.
- Babor, T. F., Steinberg, K., Anton, R. A. Y., & Boca, F. D. (2000). Talk is cheap: measuring drinking outcomes in clinical trials. *Journal of Studies on Alcohol and Drugs*, 61, 55.
- Baldwin, M. W., & Holmes, J. G. (1987). Salient private audiences and awareness of the self. *Journal of Personality and Social Psychology*, 52, 1087. doi: 10.1037/0022-3514.52.6.1087
- Baldwin, M. W. (1994). Primed relational schemas as a source of self-evaluative reactions. *Journal of Social and Clinical Psychology*, 13, 380-403. doi: 10.1521/jscp.1994.13.4.380
- Baldwin, M. W., & Sinclair, L. (1996). Self-esteem and "if... then" contingencies of interpersonal acceptance. *Journal of Personality and Social Psychology*, 71, 1130. doi: 10.1037/0022-3514.71.6.1130
- Bagnardi, V., Blangiardo, M., La Vecchia, C., & Corrao, G. (2001). A meta-analysis of alcohol drinking and cancer risk. *British Journal of Cancer*, 85, 1700. doi: 10.1054/bjoc.2001.2140
- Barefoot, J. C., Dodge, K. A., Peterson, B. L., Dahlstrom, W. G., & Williams Jr, R. B. (1989). The Cook-Medley hostility scale: item content and ability to predict survival. *Psychosomatic Medicine*, 51, 46-57.
- Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2003). Does high self-esteem cause better performance, interpersonal success, happiness, or healthier lifestyles?. *Psychological Science in the Public Interest*, 4(1), 1- 44. doi: 10.1111/1529-1006.01431

- Baumeister, R. F., Smart, L., & Boden, J. M. (1996). Relation of threatened egoism to violence and aggression: the dark side of high self-esteem. *Psychological Review*, 103, 2-33. doi: 10.1037/0033-295X.103.1.5
- Bechtoldt, M. N., De Dreu, C. K., Nijstad, B. A., & Zapf, D. (2010). Self-Concept Clarity and the Management of Social Conflict. *Journal of Personality*, 78, 539-574. doi: 10.1111/j.1467-6494.2010.00626.x
- Becker, U., Deis, A., Sorensen, T. I., Gronbaek, M., Borch-Johnsen, K., Muller, C. F., ... & Jensen, G. (1996). Prediction of risk of liver disease by alcohol intake, sex, and age: a prospective population study. *Hepatology*, 23, 1025-1029. doi: 10.1002/hep.510230513
- Bjorner, B.J., Sondergaard Kristensen, T., Orth-Gomér, K., Tibblin, G., Sullivan, M., Westerholm, P. (1996) Self-Rated Health: a Useful Concept in Research, Prevention and Clinical Medicine. *Stockholm: The Swedish Council for Planning and Coordination of Research*.
- Blanchard, C. M., Stein, K. D., Baker, F., Dent, M. F., Denniston, M. M., Courneya, K. S., & Nehl, E. (2004). Association between current lifestyle behaviors and health-related quality of life in breast, colorectal, and prostate cancer survivors. *Psychology & Health*, 19, 1-13. doi:10.1080/08870440310001606507
- Blascovich, J., & Tomaka, J. (1991). Measures of self-esteem. *Measures of Personality and Social Psychological Attitudes*, 1, 115-160.
- Block, L. B., & Williams, P. (2006) Undoing the effects of seizing and freezing: Decreasing defensive processing of personally relevant messages. *Journal of Applied Social Psychology*, 32, 803-830. doi: 10.1111/j.1559-1816.2002.tb00243.x

- Blume, S. B. (1991). Sexuality and stigma: The alcoholic woman. *Alcohol Health & Research World, 15*, 139-146.
- Boney-McCoy, S., Gibbons, F. X., Gerrard, M. (1999). Self-esteem, compensatory self-enhancement and the consideration of health risk. *Personality and Social Psychology Bulletin, 25*, 954-965. doi: 10.1177/01461672992511004
- Bos, A. E., Huijding, J., Muris, P., Vogel, L. R., & Biesheuvel, J. (2010). Global, contingent and implicit self-esteem and psychopathological symptoms in adolescents. *Personality and Individual Differences, 48*, 311-316. doi: 10.1016/j.paid.2009.10.025
- Bosson, J. K., Brown, R. P., Zeigler-Hill, V., & Swann, W. B. (2003). Self-enhancement tendencies among people with high explicit self-esteem: The moderating role of implicit self-esteem. *Self and Identity, 2*, 169-187. doi: 10.1080/15298860309029
- Brown, S., & Locker, E. (2009). Defensive responses to an emotive anti-alcohol message. *Psychology and Health, 24*(5), 517-528. doi: 10.1080/08870440801911130
- Brown, S. L., & Smith, E. Z. (2007). The inhibitory effect of a distressing anti-smoking message on risk perceptions in smokers. *Psychology and Health, 22*(3), 255-268. doi: 10.1080/14768320600843127
- Buckworth, J., & Nigg, C. (2004). Physical activity, exercise, and sedentary behavior in college students. *Journal of American College Health, 53*, 28-34  
doi:10.3200/JACH.53.1.28-34
- Camp, D. E., Klesges, R. C., & Relyea, G. (1993). The relationship between body weight concerns and adolescent smoking. *Health Psychology, 12*, 24. doi: 10.1037/0278-6133.12.1.24



- Campbell, J. D., Trapnell, P. D., Heine, S. J., Katz, I. M., Lavalley, L. F., Lehrman, D. R. (1996). Self-concept clarity: Measurement, personality correlates, and cultural boundaries. *Journal of Personality and Social Psychology*, 70, 141-156. doi: 10.1037/0022-3514.70.1.141
- Chabrol, H., Rousseau, A., & Callahan, S. (2006). Preliminary results of a scale assessing instability of self-esteem. *Canadian Journal of Behavioural Science*, 38, 136-141. doi: 10.1037/cjbs2006003
- Christiansen, M., Vik, P. W., & Jarchow., A. (2002). College student heavy drinking in social contexts versus alone. *Addictive Behaviours*, 27, 393–404.
- Cohen, G. L., & Sherman, D. K. (2014). The psychology of change: Self-affirmation and social psychological intervention. *Annual Review of Psychology*, 65, 333-371. doi: 10.1146/annurev-psych-010213-115137
- Cohen, G. L., Garcia, J., Apfel, N., Master, A. (2006). Reducing the racial achievement gap: A social-psychological intervention. *Science*, 313, 1307-1310. doi: 10.1126/science.1128317
- Cohen, G.L., Garcia, J., Purdie-Vaughns, V., Apfel, N., & Brzustoski, P. (2009). Recursive processes in self-affirmation: Intervening to close the minority achievement gap. *Science*, 324, 400-403. doi: 10.1126/science.1170769
- Conner, M., Warren, R., Close, S., & Sparks, P. (1999). Alcohol consumption and the theory of planned behavior: An examination of the cognitive mediation of past behavior. *Journal of Applied Social Psychology*, 29(8), 1676-1704. doi: 10.1111/j.1559-1816.1999.tb02046.x
- Cooke, R., Sniehotta, F.F., Schüz, B. (2007). Predicting binge-drinking behaviour using an extended TPB: Examining the impact of anticipated regret and descriptive norms. *Alcohol & Alcoholism*, 42, 84-91. doi:10.1093/alcalc/agl115

- Cooke, R., Trebaczyk, H., Harris, P., & Wright, A. J. (2014). Self-affirmation promotes physical activity. *Journal of Sport & Exercise Psychology*, 36, 217-223.
- Coopersmith, S. (1981). Self-esteem inventory. *Counselling Psychologists*, Palo Alto, CA.
- Corrao, G., Rubbiati, L., Bagnardi, V., Zambon, A., & Poikolainen, K. (2000). Alcohol and coronary heart disease: a meta-analysis. *Addiction*, 95, 1505-1523. doi: 10.1046/j.1360-0443.2000.951015056.
- Correll, J., Spencer, S.J., & Zanna, M. P. (2004). An affirmed self and an open mind: Self-affirmation and sensitivity to argument strength. *Journal of Experimental Social Psychology*, 40, 350-356. doi: 10.1016/j.jesp.2003.07.001
- Creswell, J. D., Welch, W. T., Taylor, S. E., Sherman, D. K., Grunewald, T. L., & Mann, T. (2005). Affirmation of personal values buffers neuroendocrine and psychological stress responses. *Psychological Science*, 16, 846 – 851. doi:10.1111/j.1467-9280.2005.01624
- Crocker, J. (2002). The costs of seeking self-esteem. *Journal of Social Issues*, 58, 597-615. doi: 10.1111/1540-4560.00279
- Crocker, J. & Luthanen, R. K. (2003). Levels of self-esteem and contingencies of self-worth: Unique effects on academic, social and financial problems in college students. *Personality and Social Psychology Bulletin*, 29, 701-712. doi: 10.1177/0146167203029006003
- Croyle, R. T., Sun, Y. C., & Louie, D. H. (1993). Psychological minimization of cholesterol test results: Moderators of appraisal in college students and community residents. *Health Psychology*, 12(6), 503. doi:10.1037/0278-6133.12.6.503

- Cumming, G. (2014). The New Statistics: Why and How? *Psychological Science*, 27, 7-29. doi: 10.1177/0956797613504966
- Cunningham, W. A., Preacher, K. J., & Banaji, M. R. (2001). Implicit attitude measures: Consistency, stability, and convergent validity. *Psychological Science*, 12, 163-170. doi: 10.1111/1467-9280.00328
- Davis, R. N. (1999). Web-based administration of a personality questionnaire: Comparison with traditional methods. *Behavior Research Methods, Instruments, & Computers*, 31, 572-577. doi: 10.3758/BF03200737
- Deci, E. L., & Ryan, R. M. (1995). Human autonomy. In *Efficacy, agency, and self-esteem* (pp. 31-49). Springer US.
- Del Boca, F. K., & Darkes, J. (2003). The validity of self-reports of alcohol consumption: state of the science and challenges for research. *Addiction*, 98, 1-12. doi: 10.1046/j.1359-6357.2003.00586.x
- Department of Health (2004). *At least five a week: Evidence of the impact of physical activity and its relationship to health*. Retrieved on 10 August 2009 from [http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/documents/digitalasset/dh\\_4080981.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4080981.pdf).
- Department of Health (2009). *Be active, be healthy: A plan for getting the nation moving*. Retrieved on 4 August 2014 from [http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/documents/digitalasset/dh\\_094359.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_094359.pdf)
- Department of Health (2011). *Physical activity guidelines for adults*. Retrieved on 30th August 2014 from <https://www.gov.uk/government/publications/uk-physical-activity-guidelines>

- Department of Health. (2013). *Reducing harmful drinking*. Retrieved on 30th June 2014 from <https://www.gov.uk/government/policies/reducing-harmful-drinking>
- Dillard, A. J., McCaul, K. D., & Magnan, R. E. (2005). Why is such a smart person like you smoking? Using self-affirmation to reduce defensiveness to cigarette warning labels. *Journal of Biobehavioural Research*, *10*, 165-182. doi: 10.1111/j.1751-9861.2005.tb00010.x
- Dodgson, P. G., & Wood, J. V. (1998). Self-Esteem and the Cognitive Accessibility of Strengths and Weaknesses After Failure. *Journal of Personality and Social Psychology*, *75*, 178-197. doi: 10.1037/0022-3514.75.1.178
- Dunn, A. L., Marcus, B. H., Kampert, J. B., Garcia, M. E., Kohl III, H. W., & Blair, S. N. (1999). Comparison of lifestyle and structured interventions to increase physical activity and cardiorespiratory fitness: a randomized trial. *JAMA*, *281*, 327-334. doi: 10.1001/jama.295.5.487.
- During, C. & Jessop, D. C. (2014). The moderating impact of self-esteem on self-affirmation effects. *British Journal of Health Psychology*, published online in March. doi:10.1111/bjhp.12097
- Epton, T., & Harris, P. R. (2008). Self-affirmation promotes health behaviour change. *Health Psychology*, *27*, 746-752. doi: 10.1037/0278-6133.27.6.746
- Erickson, K. I., Prakash, R. S., Voss, M. W., Chaddock, L., Hu, L., Morris, K. S., ... & Kramer, A. F. (2009). Aerobic fitness is associated with hippocampal volume in elderly humans. *Hippocampus*, *19*, 1030-1039. doi: 10.1002/hipo.20547
- Fazio, R. H., & Olson, M. A. (2003). Implicit measures in social cognition research: Their meaning and use. *Annual Review of Psychology*, *54*, 297-327. doi: 10.1146/annurev.psych.54.101601.145225
- Fein, S., & Spencer, S. J. (1997). Prejudice as self-image maintenance: Affirming the

- self through derogating others. *Journal of Personality and Social Psychology*, 73,31. doi: 10.1037/0022-3514.73.1.31
- Freeman, M.A., Hennessy, E. V., & Marzullo, D. M. (2001). Defensive evaluation of antismoking messages among college-age smokers: The role of possible selves. *Health Psychology*, 20, 424-433. doi: 10.1037/0278-6133.20.6.424
- Gawronski, B., Hofmann, W., & Wilbur, C. J. (2006). Are “implicit” attitudes unconscious?. *Consciousness and Cognition*, 15(3), 485-499. doi: 10.1016/j.concog.2005.11.007
- Gebauer, J. E., Riketta, M., Broemer, P., & Maio, G. R. (2008). “How much do you like your name?” An implicit measure of global self-esteem. *Journal of Experimental Social Psychology*, 44, 1346-1354. doi: 10.1016/j.jesp.2008.03.016
- Gerrard, M., Gibbons, F. X., Reis-Bergan, M., & Russell, D. W. (2000). Self-esteem, self-serving cognitions and health risk behaviour. *Journal of Personality*, 68, 1178-1199. doi: 10.1111/1467-6494.00131
- Godin, G., & Kok, G. (1996). The theory of planned behavior: a review of its applications to health-related behaviors. *American Journal of Health Promotion*, 11(2), 87-98. doi: <http://dx.doi.org/10.4278/0890-1171-11.2.87>
- Godin, G., & Shephard, R. J. (1985). A simple method to assess exercise behavior in the community. *Canadian Journal of Applied Sport Sciences. Journal Canadien des Sciences Appliquees au Sport*, (10), 141-6.
- Good, A., & Abraham, C. (2007). Measuring defensive responses to threatening messages: a meta-analysis of measures. *Health Psychology Review*, 1, 208-229. doi: 10.1080/17437190802280889

- Greenberg, J., Solomon, S., & Pyszczynski, T. (1997). Terror management theory of self-esteem and cultural worldviews: Empirical assessments and conceptual refinements. *Advances in Experimental Social Psychology*, 29, 61-139. doi: 10.1016/S0065-2601(08)60016-7
- Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: attitudes, self-esteem, and stereotypes. *Psychological Review*, 102, 4. doi: 10.1037/0033-295X.102.1.4
- Gosling, S. D., Rentfrow, P. J., & Swann Jr, W. B. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality*, 37(6), 504-528. doi: 10.1016/S0092-6566(03)00046-1
- Gosling, S. D., Vazire, S., Srivastava, S., & John, O. P. (2004). Should we trust web-based studies? A comparative analysis of six preconceptions about internet questionnaires. *American Psychologist*, 59, 93-104. doi: 10.1037/0003-066X.59.2.93
- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. (1998). Measuring individual differences in implicit cognition: the implicit association test. *Journal of Personality and Social Psychology*, 74, 1464 -1480. doi: 10.1037/0022-3514.74.6.1464
- Haddock, J., & Gebauer, J. E. (2011). Defensive self-esteem impacts attention, attitude strength, and self-affirmation processes. *Journal of Experimental Social Psychology*, 47, 1276-1284. doi: 10.1016/j.jesp.2011.05.020
- Harris, P.R. (2011). Self-affirmation and the self-regulation of health behavior change. *Self and Identity*, 10, 304-314. doi: 10.1080/15298868.2010.517963
- Harris, P.R., & Epton, T. (2009). The impact of Self-affirmation on health cognition, health behaviour and other health-related responses: A narrative review. *Social*

*and Personality Psychology Compass*, 6, 962-978. doi: 10.1111/j.1751-9004.2009.00233.x

Harris, P.R., & Epton, T. (2010). The impact of self-affirmation on health-related cognition and health behaviour: Issues and Prospects. *Social and Personality Psychology Compass*, 3, 1-16. doi: 10.1111/j.1751-9004.2010.00270.x

Harris, P. R., Mayle, K., Mabbott, L., & Napper, L. (2007). Self-affirmation reduces smokers' defensiveness to graphic on-pack cigarette warning labels. *Health Psychology*, 26, 437-446. doi: 10.1037/0278-6133.26.4.437

Harris, P. R., & Napper, L. (2005). Self-affirmation and biased processing of threatening health-risk information. *Personality and Social Psychology Bulletin*, 31, 1250-1263. doi: 10.1177/0146167205274694

Health & Social Care Information Centre (2014). *Statistics on Alcohol (England)*.

Retrieved on 1 May 2014 from <http://www.hscic.gov.uk/catalogue/PUB14184>

Heppner, L.W. & Kernis, M. H. (2011). High Self-esteem: Multiple forms and their outcomes. In S. J. Schwartz et al (Eds.), *Handbook of Identity Theory and Research* (pp.329-355). New York: Springer Science + Business Media.

Hirose, K., Hamajima, N., Takezaki, T., Miura, S., & Tajima, K. (2003). Physical exercise reduces risk of breast cancer in Japanese women. *Cancer Science*, 94, 193-199. doi: 10.1111/j.1349-7006.2003.tb01418.x

Holland, R., Meertens, R. M., & van Vugt, M. (2002). Dissonance on the Road: Self-Esteem as a Moderator of Internal and External Self-Justification Strategies. *Personality and Social Psychology Bulletin*, 28, 1713-1724. doi: 10.1177/014616702237652

- Janis, I. L., & Field, P. B. (1959). Sex differences and personality factors related to persuasibility. In C. I. Hovland & I. L. Janis (Eds.), *Personality and Persuasibility* (pp. 55-68). New Haven, CT: Yale University Press
- Jaremka, L. M., Bunyan, D. P., Collins, N. L., & Sherman, D. K. (2011). Reducing defensive distancing: Self-affirmation and risk regulation in response to relationship threats. *Journal of Experimental Social Psychology*, 47, 264-268. doi: 10.1016/j.jesp.2010.08.015
- Jessop, D. C., Simmonds, L. V., & Sparks, P. (2009). Motivational and behavioural consequences of self-affirmation interventions: A study of sunscreen use among women. *Psychology and Health*, 24, 529-544. doi: 10.1080/08870440801930320
- Jessop, D. C., Sparks, P., Buckland, N., Harris, P. R., & Churchill, S. (2014). Combining self-affirmation and implementation intentions: evidence of detrimental effects on behavioural outcomes. *Annals of Behavioural Medicine*, 47, 137-147. doi: 10.1007/s12160-013-9536-0
- Keller, P. A. (1999). Converting the unconverted: the effect of inclination and opportunity to discount health-related fear appeals. *Journal of Applied Psychology*, 84, 403-415.
- Kernis, M. H. (2005). Measuring Self-Esteem in Context: The Importance of Stability of Self-Esteem in Psychological Functioning. *Journal of Personality*, 73, 1569-1605. doi:10.1111/j.1467-6494.2005.00359.x
- Kernis, M. H., Cornell, D. P., Sun, C. R., Berry, A., & Harlow, T. (1993). There's more to self-esteem than whether it is high or low: the importance of stability of self-esteem. *Journal of Personality and Social Psychology*, 65, 1190. doi: 10.1037/0022-3514.65.6.1190



- Kernis, M. H., & Goldman, B. M. (2006). Assessing stability of self-esteem and contingent self-esteem. In M. H. Kernis (Ed.), *Self-esteem issues and answers: A sourcebook of current perspectives* (pp. 77-85). New York: Psychology Press.
- Kernis, M. H., Grannemann, B. D., & Barclay, L. C. (1992). Stability of self-esteem: Assessment, correlates, and excuse making. *Journal of Personality*, 60, 621-644. doi: 10.1111/j.1467-6494.1992.tb00923.x
- Kernis, M. H., Lakey, C. E., & Heppner, W. L. (2008). Secure Versus Fragile High Self-Esteem as a Predictor of Verbal Defensiveness: Converging Findings Across Three Different Markers. *Journal of Personality*, 76, 477-512. doi: 10.1521/jscp.2011.30.10.1069
- Kernis, M. H., Whisenhunt, C. R., Waschull, S. B., Greenier, K. D., Berry, A. J., Herlocker, C. E., & Anderson, C. A. (1998). Multiple facets of self-esteem and their relations to depressive symptoms. *Personality and Social Psychology Bulletin*, 24, 657-668. doi: 10.1177/0146167298246009
- Kinmonth, A., Wareham, N. J., Hardeman, W., Sutton, S., Prevost, A. T., Fanshawe, T., Williams, K. M., Ekelund, U., Spiegelhalter, D., & Griffin, S. J. (2008). Efficacy of a theory-based behavioural intervention to increase physical activity in an at-risk group in primary care (ProActive UK): A randomised trial. *The Lancet*, 371, 41-48. doi:10.1016/S0140-6736(08)60070-7
- Klein, M. P., & Harris, P. R. (2009). Self-affirmation enhances attentional bias toward threatening components of a persuasive message. *Psychological Science*, 20, 1463-1467. doi: 10.1111/j.1467-9280.2009.02467.x
- Klein, M.P, Harris, P. R., Ferrer, R. A. & Zajac, L. E. (2011). Feelings of vulnerability in response to threatening messages: Effects of self-affirmation. *Journal of Experimental Social Psychology*, 47, 1237-1242.

- Koole, S. L., Smeets, K., van Knippenberg, A., & Dijksterhuis, A. (1999). The cessation of rumination through self-affirmation. *Journal of Personality and Social Psychology*, 77, 111-125. doi: 10.1037/0022-3514.77.1.111
- Kramer, A. F., Erickson, K. I., & Colcombe, S. J. (2006). Exercise, cognition, and the aging brain. *Journal of Applied Physiology*, 101, 1237-1242. doi: 10.1152/jappphysiol.00500.2006
- Leary, M. R., & Jones, J. L. (1993). The social psychology of tanning and sunscreen use: Self-presentational motives as a predictor of health risk. *Journal of Applied Social Psychology*, 23, 1390-1406. doi: 10.1111/j.1559-1816.1993.tb01039.x
- Lieberman, A., & Chaiken, S. (1992). Defensive processing of personally relevant health messages. *Personality and Social Psychology Bulletin*, 18, 669-679. doi: 10.1177/0146167292186002
- Logel, C., & Cohen, G. L. (2011). The role of the self in physical health: testing the effect of a values affirmation intervention on weight loss. *Psychological Science*, 1-3. doi: 10.1177/0956797611421936
- McGee, R., & Williams, S. (2000). Does low self-esteem predict health compromising behaviours among adolescents? *Journal of Adolescence*, 23, 569-582. doi: 10.1006/jado.2000.0344
- Mcmillan, B., & Conner, M. (2003). Applying an Extended Version of the Theory of Planned Behavior to Illicit Drug Use Among Students<sup>1</sup>. *Journal of Applied Social Psychology*, 33(8), 1662-1683. doi: 10.1111/j.1559-1816.2003.tb01968.x
- McQueen, A., & Klein, W. M. (2006). Experimental manipulations of self-affirmation: A systematic review. *Self and Identity*, 5, 289-354. doi: 10.1080/15298860600805325

- Miller, D.J., Freedson, P.S., & Kline, G. M. (1994). Comparison of activity levels using the Caltrac accelerator and five questionnaires. *Medicine and Science in Sports and Exercise*, 26, 376-382. doi: 10.1249/00005768-199403000-00016
- Milne, S., Orbell, S., & Sheeran, P. (2002). Combining motivational and volitional interventions to promote exercise participation: Protection motivation theory and implementation intentions. *British Journal of Health Psychology*, 7(2), 163-184. doi: 10.1348/135910702169420
- Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004). Actual causes of death in the United States in 2000. *Journal of the American Medical Association*, 291, 1238-1245. doi: 10.1001/jama.291.10.1238
- Myers, J., Kaykha, A., George, S., Abella, J., Zaheer, N., Lear, S., ... & Froelicher, V. (2004). Fitness versus physical activity patterns in predicting mortality in men. *The American Journal of Medicine*, 117, 912-918. doi: 10.1016/j.amjmed.2004.06.047
- Naglieri, J. A., Drasgow, F., Schmit, M., Handler, L., Prifitera, A., Margolis, A., & Velasquez, R. (2004). Psychological Testing on the Internet: New Problems, Old Issues. *American Psychologist*, 59, 150. doi: 10.1037/0003-066X.59.3.150
- Neighbors, C., Larimer, M. E., Markman Geisner, I., & Knee, C. R. (2004). Feeling controlled and drinking motives among college students: Contingent self-esteem as a mediator. *Self and Identity*, 3, 207-224. doi:10.1080/13576500444000029
- Nezlek, J. B., & Plesko, R. M. (2001). Day-to-day relationships among self-concept clarity, self-esteem, daily events, and mood. *Personality and Social Psychology Bulletin*, 27, 201-211. doi: 10.1177/0146167201272006

- NHS Choices (2013). *Physical activity guidelines for adults*. Retrieved on 3 August 2014 from <http://www.nhs.uk/Livewell/fitness/Pages/physical-activity-guidelines-for-adults.aspx>
- Pelham, B. W., Koole, S. L., Hardin, C. D., Hetts, J. J., Seah, E., & DeHart, T. (2005). Gender moderates the relation between implicit and explicit self-esteem. *Journal of Experimental Social Psychology*, 41, 84-89.
- Penedo, F. J., & Dahn, J. R. (2005). Exercise and well-being: a review of mental and physical health benefits associated with physical activity. *Current Opinion in Psychiatry*, 18, 189-193. doi: 10.1097/00001504-200503000-00013
- Pietersma, S., & Dijkstra, A. (2012). Cognitive self-affirmation inclination: an individual difference in dealing with self-threats, *British Journal of Social Psychology*, 5, 33-51. doi: 0.348/044666.0X533768
- Reed, M. B., & Aspinwall, L.G. (1998). Self-affirmation reduces biased processing of health-risk information. *Motivation & Emotion*, 22, 99-132. doi: 10.1023/A:1021463221281
- Room, R., Babor, T., & Rehm, J. (2005). Alcohol and public health. *The Lancet*, 365, 519-530. doi: 10.1016/S0140-6736(05)17870-2
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Ryan, R. M., & Brown, K. W. (2003). Why we don't need self-esteem: On fundamental needs, contingent love, and mindfulness. *Psychological Inquiry*, 71-76.
- Schmeichel, B. J., & Vohs, K. (2009). Self-affirmation and self-control: Affirming core values counteracts ego depletion. *Journal of Personality and Social Psychology*, 96, 770-782. doi: 10.1037/a0014635

- Sheeran, P. (2002). Intention-behavior relations: A conceptual and empirical review. *European Review of Social Psychology*, 12, 1-36.  
doi:10.1080/14792772143000003
- Sherman, D. K., & Cohen, G. L. (2006). The psychology of self-defence: Self-affirmation theory. In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology*, 38, 183-242. doi: 10.1016/S0065-2601(06)38004-5
- Sherman, D. K., & Kim, H. S. (2005). Is there an “I” in “team”? The role of the self in group-serving judgments. *Journal of Personality and Social Psychology*, 88, 108-120. doi: 10.1037/0022-3514.88.1.108
- Sherman, D. A. K., Nelson, L. D., & Steele, C. M. (2000). Do messages about health risks threaten the self? Increasing acceptance of threatening health messages via self-affirmation. *Personality and Social Psychology Bulletin*, 26, 1046-1058.  
doi: 10.1177/01461672002611003
- Sherman, D. K., Hartson, K. A., Binning, K. R., Purdie-Vaughns, V., Garcia, J., Taborsky-Barba, S., Tomassetti, S., Nussbaum, A. D., & Cohen, G. L. (2013). Deflecting the Trajectory and Changing the Narrative: How Self-Affirmation Affects Academic Performance and Motivation Under Identity Threat. *Journal of Personality and Social Psychology*. Advance online publication. doi: 10.1037/a0031495
- Siegel, P. A., Scillitoe, J., & Parks-Yancy, R. (2005). Reducing the tendency to self-handicap: The effect of self-affirmation. *Journal of Experimental Social Psychology*, 41, 589-597. doi: 10.1016/j.jesp.2004.11.004
- Smith, T. W., Orleans, C. T., & Jenkins, C. D. (2004). Prevention and Health promotion: Decades of progress, new challenges, and an emerging agenda. *Health Psychology*, 23, 126-131. doi: 10.1037/0278-6133.23.2.126

- Smith-Warner, S. A., Spiegelman, D., Yaun, S. S., van den Brandt, P. A., Folsom, A. R., Goldbohm, R. A., ... & Hunter, D. J. (1998). Alcohol and breast cancer in women: a pooled analysis of cohort studies. *JAMA*, 279, 535-540. doi: 10.7326/0003-4819-140-8-200404200-00007
- Sobell, L. C., & Sobell, M. B. (1992). Timeline follow-back. In *Measuring alcohol consumption* (pp. 41-72). Humana Press.
- Soenens, B., & Duriez, B. (2012). Does conservatism have a self-esteem enhancing function? An examination of associations with contingent self-worth and ill-being in late adults. *Personality and Individual Differences*, 52, 728-732. doi: 10.1016/j.paid.2011.12.037
- Spencer, S. J., Fein, S., & Lomore, C. D. (2001). Maintaining one's self-image vis-à-vis others: the role of self-affirmation in the social evaluation of the self. *Motivation and Emotion*, 25, 41-65. doi: 10.1023/A:1010659805978
- Spencer, S. J., Josephs, R. A., & Steele, C. M. (1993). Low self-esteem: The uphill struggle for self-integrity. In R. F. Baumeister (Ed), *Self-esteem: The puzzle of low self-regard* (pp. 21-36). New York: Plenum Press. doi: 10.1007/978-1-4684-8956-9\_2
- Stanley, M. A., & Maddux, J. E. (1986). Cognitive processes in health enhancement: Investigation of a combined protection motivation and self-efficacy model. *Basic and Applied Social Psychology*, 7(2), 101-113. doi: 10.1207/s15324834basp0702\_2
- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (pp. 261-302). New York: Academic Press.

- Steele, C. M. (1983). Dissonance processes as self-affirmation. *Journal of Personality and Social Psychology*, 45, 5-19. doi: 10.1037/0022-3514.45.1.5
- Steele, C. M., Spencer, S. J., & Lynch, M. (1993). Self-image resilience and dissonance: the role of affirmational resources. *Attitudes and Social Cognition*, 64, 885-896. doi: 10.1037/0022-3514.64.6.885
- Stinson, D. A., Logel, C., Zanna, M.P., Holmes, J. G., Cameron, J. J., Wood, J. V., & Spencer, S. J. (2008). The cost of lower self-esteem: testing a self-and social-bonds model of health. *Journal of Personality & Social Psychology*, 94, 412-428. doi: 10.1037/0022-3514.94.3.412
- Stuteville, J. R. (1970). Psychic defenses against high fear appeals: A key marketing variable. *The Journal of Marketing*, 39-45.
- Toma, C. L. (2010). Affirming the self through online profiles: beneficial effects of social networking sites. In *Proceedings of the SIGCHI conference on human factors in computing systems*, 1749-1752. doi: 10.1145/1753326.1753588
- Toma, C. L., & Hancock, J. T. (2013). Self-affirmation underlies Facebook use. *Personality and Social Psychology Bulletin*, 39, 321-331. doi: 10.1177/0146167212474694
- Trzesniewski, K. H., Donnellan, M. B., Moffitt, T. E., Robins, R. W., Poulton, R., & Caspi, A. (2006). Low self-esteem during adolescence predicts poor health, criminal behavior, and limited economic prospects during adulthood. *Developmental Psychology*, 42, 381. doi: 10.1037/0012-1649.42.2.381
- Uusitupa, M., Louheranta, A., Lindström, J., Valle, T., Sundvall, J., Eriksson, J., & Tuomilehto, J. (2000). The Finnish diabetes prevention study. *British Journal of Nutrition*, 83, S137-S142. doi: <http://dx.doi.org/10.1017/S0007114500001070>

- van Dijk, W.W., van Koningsbruggen, G. M., Ouwerkerk, J.W., Wesseling, Y. M. (2011). Self-esteem, self-affirmation, and schadenfreude. *Emotion, 11*, 1445–1449. doi: 10.1037/a0026331
- van Koningsbruggen, G. M., Das, E., & Roskos-Ewoldsen, D. R. (2009). How self-affirmation reduces defensive processing of threatening health information. *Health Psychology, 28*, 563-568. doi: 10.1037/a0015610
- van Koningsbruggen, G. M. & Das, E. (2009). Don't derogate this message! Self-affirmation promotes online type 2 diabetes risk test taking. *Psychology & Health, 24*, 635-649. doi: 10.1080/08870440802340156
- van Koningsbruggen, G. M., Harris, P. R., Smits, A. J., Schüz, B., Scholz, U., & Cooke, R. (2014). Self-affirmation before exposure to health communications promotes intentions and health behavior change by increasing anticipated regret. *Communication Research*. doi:10.1177/0093650214555180
- Van 't Riet, J & Ruiter, R. A. C. (2011). Defensive reactions to health-promoting information: an overview and implications for future research, *Health Psychology Review, 7*, 104-136. doi: 10.1080/17437199.2011.606782
- Wilsnack, R. W., Wilsnack, S. C., Kristjanson, A. F., Vogeltanz-Holm, N. D., & Gmel, G. (2009). Gender and alcohol consumption: patterns from the multinational GENACIS project. *Addiction, 104*, 1487-1500. doi: 10.1111/j.1360-0443.2009.02696.x
- Whiteside, S. P., & Lynam, D. R. (2001). The five factor model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and Individual differences, 30*, 669-689.
- World Health Organization website (2013). *Ten facts on noncommunicable diseases*. Retrieved 30<sup>th</sup> of June 2014 from



[http://www.who.int/features/factfiles/noncommunicable\\_diseases/facts/en/](http://www.who.int/features/factfiles/noncommunicable_diseases/facts/en/)

World Health Organization website (2014). *Alcohol factsheet*. Retrieved 30<sup>th</sup> of June

2014 from <http://www.who.int/mediacentre/factsheets/fs349/en/>

Wright, K. B. (2005). Researching Internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-Mediated Communication*, 10. doi: 10.1111/j.1083-6101.2005.tb00259.x

Zeigler-Hill, V. (2006). Discrepancies between implicit and explicit self-esteem: Implications for narcissism and self-esteem instability. *Journal of Personality*, 74, 119-144. doi: 10.1111/j.1467-6494.2005.00371.x

Zeigler-Hill, V., Besser, A., & King, K. (2011). Contingent self-esteem and anticipated reactions to interpersonal rejection and achievement failure. *Journal of Social and Clinical Psychology*, 30, 1069-1096. doi: 10.1521/jscp.2011.30.10.1069

Zeigler-Hill, V., Clark, C. B., & Beckman, T. E. (2011). Fragile self-esteem and the interpersonal circumplex: Are feelings of self-worth associated with interpersonal style?. *Self and Identity*, 10, 509-536. doi: 10.1080/15298868.2010.497376

Zuckerman, M. (1979). *Sensation seeking: Beyond the optimal level of arousal*. Hillsdale, NJ: Erlbaum.

## **Appendices**

Appendix 1 – Questionnaires referred to in Chapter 2

Appendix 2 – Questionnaires referred to in Chapter 3

Appendix 3 – Questionnaires referred to in Chapter 4

Appendix 4 – Questionnaires referred to in Chapter 5

## Appendix 1 - Questionnaires referred to in Chapter 2

### Chapter 2

#### Time 1

**All participants completed the following sections:**

#### **Questionnaire Time One**

**Thank you for agreeing to take part in this study.**

This questionnaire is the **first part** of our three-part study and I shall be contacting you in a week's time to ask you some further questions, and then again a week later.

Participants who complete all three questionnaires will be entered in to a prize draw with the chance of **winning £100!**

**You are welcome to take part if you are:**

Over the age of 18

Fluent in written and spoken English

#### **PLEASE NOTE:**

**In this questionnaire we would like to find out a bit more about you and what you are like.**

There are no right or wrong answers to any of the questions. We are interested only in finding out about your thoughts and feelings.

Your answers will be kept confidential.

You are under no obligation to take part in this study. Participation is purely voluntary and you are free to withdraw at any time.

Names and e-mail addresses will be removed from all files as soon as the final phase of the study has been completed, and your answers will be stored anonymously from that point.

**Please read the instructions carefully and answer the questions in the order they appear on the page.**

**You will not be able to return to a page once you have clicked the continue button. Please answer the following questions**

- 1. Please enter today's date (dd/mm/yyyy) (Optional)**

**2. Please enter your e-mail (This is vital information so we can contact you with the second part of the study, and so you can be contacted if you are the winner of the prize draw) (Optional)**

**3. Please enter your name**  
(Optional)

**4. Are you male or female? (Optional)**

Male Female

**5. What is your age? (Optional)**

**6. What is your current occupation?**  
(Optional)

Student Employed Unemployed

Other (please specify):

**7. If you answered student in the previous question, what subject are you studying?**  
(Optional)

**8. Please select a country to describe your nationality (Optional)**

If you selected Other, please specify:

**Are you fluent in English?**  
(Optional)

YES NO

**Below are a number of characteristics that may or may not apply to you.**

**Please indicate the extent to which you agree or disagree with each of the following statements**

**9. I see myself as someone who is talkative (Optional)**

Disagree strongly

Disagree a little

Neither agree nor disagree

Agree a little

Agree strongly

**10. I see myself as someone who tends to find fault with others (Optional)**

Disagree strongly

Disagree a little

Neither agree nor disagree

Agree a little  
Agree strongly

**11. I see myself as someone who does a thorough job** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree  
Agree a little  
Agree strongly

**12. I see myself as someone who is depressed, blue** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree  
Agree a little  
Agree strongly

**13. I see myself as someone who is original, comes up with new ideas** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree  
Agree a little  
Agree strongly

**14. I see myself as someone who is reserved** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree  
Agree a little  
Agree strongly

**15. I see myself as someone who is helpful and unselfish with others** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree  
Agree a little  
Agree strongly

**16. I see myself as someone who can be somewhat careless** *(Optional)*

Disagree strongly  
Disagree a little

Neither agree nor disagree  
 Agree a little  
 Agree strongly

**17. I see myself as someone who is relaxed, handles stress well** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**18. I see myself as someone who is curious about many different things** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**19. I see myself as someone who is full of energy** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**20. I see myself as someone who starts quarrels with others** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**21. I see myself as someone who is a reliable worker** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**22. I see myself as someone who can be tense** *(Optional)*

Disagree strongly  
 Disagree a little

Neither agree nor disagree  
 Agree a little  
 Agree strongly

**23. I see myself as someone who is ingenious, a deep thinker** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**24. I see myself as someone who generates a lot of enthusiasm** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**25. I see myself as someone who has a forgiving nature** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**26. I see myself as someone who tends to be disorganised** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**27. I see myself as someone who worries a lot** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**28. I see myself as someone who has an active imagination** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree

Agree a little  
Agree strongly

**29. I see myself as someone who tends to be quiet** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree  
Agree a little  
Agree strongly

---

**Below are a number of characteristics that may or may not apply to you.**

**Please indicate the extent to which you agree or disagree with each of the following statements.**

**30. I see myself as someone who is generally trusting** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree  
Agree a little  
Agree strongly

**31. I see myself as someone who tends to be lazy** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree  
Agree a little  
Agree strongly

**32. I see myself as someone who is emotionally stable, not easily upset** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree  
Agree a little  
Agree strongly

**33. I see myself as someone who is insensitive** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree



Agree a little  
Agree strongly

**34. I see myself as someone who has an assertive personality** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree  
Agree a little  
Agree strongly

**35. I see myself as someone who can be cold and aloof** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree  
Agree a little  
Agree strongly

**36. I see myself as someone who perseveres until the task is finished** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree  
Agree a little  
Agree strongly

**37. I see myself as someone who can be moody** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree  
Agree a little  
Agree strongly

**38. I see myself as someone who values artistic, aesthetic experiences** *(Optional)*

Disagree strongly  
Disagree a little  
Neither agree nor disagree  
Agree a little  
Agree strongly

**39. I see myself as someone who is sometimes shy, inhibited** *(Optional)*

Disagree strongly  
Disagree a little

Neither agree nor disagree  
 Agree a little  
 Agree strongly

**40. I see myself as someone who is considerate and kind to almost everyone** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**41. I see myself as someone who does things efficiently** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**42. I see myself as someone who remains calm in tense situations** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**43. I see myself as someone who prefers work that is routine** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**44. I see myself as someone who is outgoing, sociable** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**45. I see myself as someone who is sometimes rude to others** *(Optional)*

Disagree strongly  
 Disagree a little

Neither agree nor disagree  
 Agree a little  
 Agree strongly

**46. I see myself as someone who makes plans and follows through with them** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**47. I see myself as someone who gets nervous easily** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**48. I see myself as someone who likes to reflect, play with ideas** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**49. I see myself as someone who has few artistic interests** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**50. I see myself as someone who likes to cooperate with others** *(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

**51. I see myself as someone who is easily distracted** *(Optional)*

Disagree strongly  
 Disagree a little

Neither agree nor disagree  
 Agree a little  
 Agree strongly

**52. I see myself as someone who is sophisticated in art, music, or literature**  
*(Optional)*

Disagree strongly  
 Disagree a little  
 Neither agree nor disagree  
 Agree a little  
 Agree strongly

---

**Please answer the following questions**

**For each of the statements below...**

...please indicate whether or not the statement is characteristic of you by clicking on the button that is to the left of the response that represents how you feel. If the statement is extremely uncharacteristic of you (not at all like you) please choose "**extremely uncharacteristic of me**", if the statement is extremely characteristic of you (very much like you) please choose "**extremely characteristic of me**". And, of course, use the responses in the middle if you fall between the extremes.

**53. I consider how things might be in the future, and try to influence those things with my day today behaviour** *(Optional)*

Extremely uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Extremely characteristic of me

**54. Often I engage in a particular behaviour in order to achieve the outcomes that may not result for many years** *(Optional)*

Extremely uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Extremely characteristic of me

**55. I only act to satisfy immediate concerns, figuring the future will take care of itself** *(Optional)*

Extremely uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain

Somewhat characteristic of me  
Extremely characteristic of me

**56. My behaviour is only influenced by the immediate (i.e., a matter of days or weeks) outcomes of my actions** *(Optional)*

Extremely uncharacteristic of me  
Somewhat uncharacteristic of me  
Uncertain  
Somewhat characteristic of me  
Extremely characteristic of me

**57. My convenience is a big factor in the decisions I make or the actions I take** *(Optional)*

Extremely uncharacteristic of me  
Somewhat uncharacteristic of me  
Uncertain  
Somewhat characteristic of me  
Extremely characteristic of me

**58. I am willing to sacrifice my immediate happiness or well-being in order to achieve future outcomes** *(Optional)*

Extremely uncharacteristic of me  
Somewhat uncharacteristic of me  
Uncertain  
Somewhat characteristic of me  
Extremely characteristic of me

**59. I think it is important to take warnings about negative outcomes seriously even if the negative outcomes will not occur for many years** *(Optional)*

Extremely uncharacteristic of me  
Somewhat uncharacteristic of me  
Uncertain  
Somewhat characteristic of me  
Extremely characteristic of me

**60. I think it is more important to perform a behaviour with important distant consequences than a behaviour with less-important immediate consequences** *(Optional)*

Extremely uncharacteristic of me  
Somewhat uncharacteristic of me  
Uncertain  
Somewhat characteristic of me  
Extremely characteristic of me

**61. I generally ignore warnings about possible future problems because I think the problems will be resolved before they reach crisis level** *(Optional)*

Extremely uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Extremely characteristic of me

**62. I think that sacrificing now is usually unnecessary since future outcomes can be dealt with at a later time** *(Optional)*

Extremely uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Extremely characteristic of me

**63. I only act to satisfy immediate concerns, figuring that I will take care of future problems that may occur at a later date** *(Optional)*

Extremely uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Extremely characteristic of me

**64. Since my day to day work has specific outcomes, it is more important to me than behaviour that has distant outcomes** *(Optional)*

Extremely uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Extremely characteristic of me

---

**Please answer the following questions**

**The following statements concern your general attitudes**

Read each statement and please indicate how much you **agree or disagree** with each statement by clicking on the button to the left of the response that represents how you feel.

**65. Regulations trigger a sense of resistance in me** *(Optional)*

Disagree strongly  
Disagree  
Neither agree nor disagree  
Agree  
Agree strongly

**66. I find contradicting others stimulating** *(Optional)*

Disagree strongly  
Disagree  
Neither agree nor disagree  
Agree  
Agree strongly

**67. I consider advice from others to be an intrusion** *(Optional)*

Disagree strongly  
Disagree  
Neither agree nor disagree  
Agree  
Agree strongly

**68. I become frustrated when I am unable to make free and independent decisions** *(Optional)*

Disagree strongly  
Disagree  
Neither agree nor disagree  
Agree  
Agree strongly

**69. I become angry when my freedom of choice is restricted** *(Optional)*

Disagree strongly  
Disagree  
Neither agree nor disagree  
Agree  
Agree strongly

**70. Advice and recommendations usually induce me to do just the opposite** *(Optional)*

Disagree strongly  
Disagree  
Neither agree nor disagree  
Agree  
Agree strongly

**71. I am content only when I am acting of my own free will** *(Optional)*

Disagree strongly  
 Disagree  
 Neither agree nor disagree  
 Agree  
 Agree strongly

**72. I resist the attempts of others to influence me** *(Optional)*

Disagree strongly  
 Disagree  
 Neither agree nor disagree  
 Agree  
 Agree strongly

**73. It makes me angry when another person is held up as a role model for me to follow** *(Optional)*

Disagree strongly  
 Disagree  
 Neither agree nor disagree  
 Agree  
 Agree strongly

**74. When someone forces me to do something, I feel like doing the opposite** *(Optional)*

Disagree strongly  
 Disagree  
 Neither agree nor disagree  
 Agree  
 Agree strongly

**75. It disappoints me to see others submitting to standards and rules** *(Optional)*

Disagree strongly  
 Disagree  
 Neither agree nor disagree  
 Agree  
 Agree strongly

---

Below is a list of statements dealing with **your general feelings about yourself**. Please click the button to the left of the response that **best represents how you feel**

**76. On the whole, I am satisfied with myself** *(Optional)*



Strongly agree  
 Agree  
 Disagree  
 Strongly disagree

**77. At times, I think I am no good at all** *(Optional)*

Strongly agree  
 Agree  
 Disagree  
 Strongly disagree

**78. I feel that I have a number of good qualities** *(Optional)*

Strongly agree  
 Agree  
 Disagree  
 Strongly disagree

**79. I am able to do things as well as most other people** *(Optional)*

Strongly agree  
 Agree  
 Disagree  
 Strongly disagree

**80. I feel I do not have much to be proud of** *(Optional)*

Strongly agree  
 Agree  
 Disagree  
 Strongly disagree

**81. I certainly feel useless at times** *(Optional)*

Strongly agree  
 Agree  
 Disagree  
 Strongly disagree

**82. I feel that I'm a person of worth, at least on an equal plane with others**  
*(Optional)*

Strongly agree  
 Agree  
 Disagree  
 Strongly disagree

**83. I wish I could have more respect for myself** *(Optional)*

Strongly agree  
 Agree  
 Disagree  
 Strongly disagree

**84. All in all, I am inclined to feel that I am a failure** *(Optional)*

Strongly agree  
 Agree  
 Disagree  
 Strongly disagree

---

**Please answer the following questions**

**For each of the statements below...**

...please indicate whether or not the statement is characteristic of you by clicking on the button that is to the left of the response that represents how you feel. If the statement is extremely uncharacteristic of you (not at all like you) please choose "**extremely uncharacteristic of me**", if the statement is extremely characteristic of you (very much like you) please choose "**extremely characteristic of me**". And, of course, use the responses in the middle if you fall between the extremes.

**85. I tend to avoid anything that may remind me of the negative consequences for my risky behaviour** *(Optional)*

Extremely uncharacteristic of me  
 Uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Characteristic of me  
 Extremely characteristic of me

**86. When confronted with the possibility of any sort of personal risk, I make myself feel at ease by saying, "This can't happen to someone like me."** *(Optional)*

Extremely uncharacteristic of me  
 Uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Characteristic of me  
 Extremely characteristic of me

**87. I tend not to think about the possibility of something bad happening to my health or well-being** *(Optional)*

Extremely uncharacteristic of me  
 Uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Characteristic of me  
 Extremely characteristic of me

**88. If I receive bad news that I'm at risk for a health problem, I would probably find ways to justify to myself that I'm not at risk** *(Optional)*

Extremely uncharacteristic of me  
 Uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Characteristic of me  
 Extremely characteristic of me

**89. Bad things generally don't happen to people like me** *(Optional)*

Extremely uncharacteristic of me  
 Uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Characteristic of me  
 Extremely characteristic of me

**90. I am at higher risk for negative consequences than the average person from my country** *(Optional)*

Extremely uncharacteristic of me  
 Uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Characteristic of me  
 Extremely characteristic of me

**91. If I was told I was at risk for a health problem, I would be sceptical** *(Optional)*

Extremely uncharacteristic of me  
 Uncharacteristic of me  
 Somewhat uncharacteristic of me

Uncertain  
 Somewhat characteristic of me  
 Characteristic of me  
 Extremely characteristic of me

**92. I generally do not feel concerned when presented with a threat to my health** *(Optional)*

Extremely uncharacteristic of me  
 Uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Characteristic of me  
 Extremely characteristic of me

**93. I find it easy to assure myself that bad things won't happen to me** *(Optional)*

Extremely uncharacteristic of me  
 Uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Characteristic of me  
 Extremely characteristic of me

**94. I tend to avoid information that I may be at risk for health problems** *(Optional)*

Extremely uncharacteristic of me  
 Uncharacteristic of me  
 Somewhat uncharacteristic of me  
 Uncertain  
 Somewhat characteristic of me  
 Characteristic of me  
 Extremely characteristic of me

---

**Final Page**

Thank you very much for taking the time to complete this questionnaire.

**In a week's time you will receive an e-mail with a web link to the second, shorter questionnaire.**

**Please try and complete the questionnaire as soon as you receive this email.**

---

**All participants completed the following sections:**

## **Exercise Questionnaire Time 2**

**Thank you for agreeing to take part in this study.**

**This questionnaire is about people's thoughts and feelings about exercise.**

This questionnaire is the **second** part of our three-part study and I shall be contacting you in a week's time to ask you some final questions.

Participants who complete all three questionnaires will be entered in to the prize draw with a chance of **winning £100!**

### **PLEASE NOTE:**

There are no right or wrong answers to any of the questions. We are interested only in finding out about your thoughts and feelings.

Your answers will be kept confidential.

You are under no obligation to take part in this study. Participation is purely voluntary and you are free to withdraw at any time.

Names and e-mail addresses will be removed from all files as soon as the final phase of the study has been completed, and your answers will be stored anonymously from that point.

**Please read the instructions carefully and answer the questions in the order they appear on the page.**

**You will not be able to return to a page once you have clicked the continue button.**

---

**Please answer the following questions**

- 1. Please enter today's date (dd/mm/yyyy) *(Optional)***
  - 2. Please enter your e-mail (This is vital information so you can be contacted if you are the winner of the prize draw. Please provide the same e-mail as in the previous questionnaire) *(Optional)***
  - 3. Please enter your name *(Optional)***
- 

**Exercise**

Now I'd like to ask you some questions about exercise. Please note that for the purpose of this study, exercise is defined as:

**"any moderate to vigorous physical activity, performed in your leisure time, that raises your heart rate, and results in you becoming warm and at least mildly out of breath."**

**4. In the past seven days on how many days have you exercised for 30 minutes or more? *(Optional)***

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7

**5. In the average week, on how many days do you exercise for 30 minutes or more? *(Optional)***

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7

**6. Considering the past 7 day period, how many times have you done the following kinds of exercise for 30 minutes or more during your free time? *(Optional)***

**a. Strenuous Exercise (heart beats rapidly) (e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance cycling)**  
*(Optional)*

**b. Moderate Exercise (not exhausting) (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk**

dancing)  
(Optional)

c. Mild Exercise (minimal effort) (e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snowmobiling, easy walking)

(Optional)

**7. Considering the past 7 day period, during your leisure time, how often have you engaged in any regular activity long enough to work up a sweat (heart beats rapidly)? (Optional)**

Often

Sometimes

Never/Rarely

---

**Participants allocated to the self-affirmation condition completed the following section:**

**Your values**

*Altruism*

*Spontaneity*

*Forgiveness*

*Loyalty*

*Honesty*

*Goodness*

*Religiousness*

*Tolerance*

*Creativity*

*Sincerity*

*Fairness*

*Resourcefulness*

8. Please select the value from the list above that is **most** important to you personally, and write it in the space provided below. If more than one value is equally important to you then please select just one to write about.

The **most** important value to me is:... *(Optional)*

9. In the space below please write a short statement (around 2-3 sentences) about why this value is important to you. Take a couple of minutes to think about this value and how this value has influenced things that you have done. Please write about how you use this value in your everyday life. *(Optional)*

---

**Participants allocated to the control condition completed the following section:**

**Your values**

*Altruism*

*Spontaneity*

*Forgiveness*

*Loyalty*

*Honesty*

*Goodness*

*Religiousness*

*Tolerance*

*Creativity*

*Sincerity*

*Fairness*

*Resourcefulness*

8. Please select the value from the list above that is **least** important to you personally, and write it in the space provided. If more than one value is equally



unimportant to you then please select just one to write about.

The **least** important value to me is:... *(Optional)*

**9.** In the space below please write a short statement (around 2-3 sentences) about why this value might be important to someone else, and how this value might influence their everyday life. *(Optional)*

---

**All participants then completed the following sections:**

**10. How important to you is the value that you selected to write about?**  
*(Optional)*

Extremely unimportant  
Unimportant  
Slightly unimportant  
Neither unimportant nor important  
Slightly important  
Important  
Extremely important

---

**Please now read the following information about exercise carefully**

Exercise is an **ESSENTIAL** part of a healthy lifestyle and if you don't do enough exercise you put yourself at risk of developing many serious health problems.

**For example, if you do not do enough exercise, compared to those who do, you are:**

- **TWICE** as likely to develop **HEART DISEASE** and **TYPE 2 DIABETES**
  - **TWICE** as likely to develop **COLON CANCER**
  - **30 - 40%** more likely to develop **BREAST CANCER**
  - at an **INCREASED risk** of developing **ANXIETY, DEPRESSION** and **DEMENTIA** in later life
- 

People who do not exercise sufficiently are **MORE LIKELY TO DIE YOUNGER.**

Being physically unfit is **JUST AS DANGEROUS AS SMOKING** in terms of lowering

life expectancy.

Physical inactivity increases the risk of **PREMATURE DEATH** by up to **30%**.

---

**It's EASY to increase the amount you exercise**

**Some people think exercise is too expensive or simply takes up too much time.**

In reality, it is easy to increase the amount you exercise and many forms of exercise are free.

**If you can find a little spare time, there are many ways to fit in some exercise and it is possible to find something to suit any kind of lifestyle.**

The key is to do activities that you enjoy and that you can do regularly.

---

**There are many different ways to exercise:**

**walking, dancing, aerobics, running, cycling or playing football to name but a few -**

and almost everyone can find some form of exercise that they will really enjoy.

With all the different options out there, **YOU** can find the form of exercise that **YOU** enjoy doing!

---

**IT'S UP TO YOU!**

**The National guidelines** recommend exercising for **30 MINUTES OR MORE** on at least **5 DAYS OF THE WEEK**

**Go on** - it's up to **YOU** to make a change!

---

**Please answer the following questions about your thoughts and feelings about exercise**

**Please click on the button to the left of the response that represents how you feel**

**11. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be *(Optional)***

Extremely bad

Bad

Slightly bad

Neither bad nor good  
Slightly good  
Good  
Extremely good

---

**12. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be** *(Optional)*

Extremely harmful  
Harmful  
Slightly harmful  
Neither harmful nor beneficial  
Slightly beneficial  
Beneficial  
Extremely beneficial

**13. I intend to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days** *(Optional)*

Disagree strongly  
Disagree  
Disagree slightly  
Neither agree nor disagree  
Agree slightly  
Agree  
Agree strongly

**14. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be** *(Optional)*

Extremely unpleasant  
Unpleasant  
Slightly unpleasant  
Neither unpleasant nor pleasant  
Slightly pleasant  
Pleasant  
Extremely pleasant

**15. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be** *(Optional)*

Extremely unenjoyable  
Unenjoyable  
Slightly unenjoyable  
Neither unenjoyable nor enjoyable  
Slightly enjoyable  
Enjoyable  
Extremely enjoyable

**16. If I increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days it will improve my health** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**17. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be** *(Optional)*

Extremely worthless  
 Worthless  
 Slightly worthless  
 Neither worthless nor valuable  
 Slightly valuable  
 Valuable  
 Extremely valuable

**18. If I wanted to I could increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**19. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be** *(Optional)*

Extremely impossible  
 Impossible  
 Slightly impossible  
 Neither impossible nor possible  
 Slightly possible  
 Possible  
 Extremely possible

**20. I will try to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**21. I believe I have complete control over increasing the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**22. I plan to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**23. It is mostly up to me whether I increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**24. Increasing the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be an effective way to improve my health** *(Optional)*

Disagree strongly  
 Disagree

Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**25. When I read the message about the dangers of not doing enough exercise my first reaction was that I did not want to think about the dangers**  
*(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither disagree nor agree  
 Agree slightly  
 Agree  
 Agree strongly

**26. I thought the information about the dangers of not doing enough exercise was overblown** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither disagree nor agree  
 Agree slightly  
 Agree  
 Agree strongly

**27. I thought the information about the dangers of not doing enough exercise was exaggerated** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither disagree nor agree  
 Agree slightly  
 Agree  
 Agree strongly

**28. I thought the information about the dangers of not doing enough exercise tried to manipulate my feelings** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither disagree nor agree  
 Agree slightly

Agree  
Agree strongly

**29. I thought the information about the dangers of not doing enough exercise tried to strain the truth** *(Optional)*

Disagree strongly  
Disagree  
Disagree slightly  
Neither disagree nor agree  
Agree slightly  
Agree  
Agree strongly

**30. When reading the information about the dangers of not doing enough exercise I felt afraid** *(Optional)*

Disagree strongly  
Disagree  
Disagree slightly  
Neither disagree nor agree  
Agree slightly  
Agree  
Agree strongly

**31. When reading the information about the dangers of not doing enough exercise I felt frightened** *(Optional)*

Disagree strongly  
Disagree  
Disagree slightly  
Neither disagree nor agree  
Agree slightly  
Agree  
Agree strongly

**32. When reading the information about the dangers of not doing enough exercise I felt worried** *(Optional)*

Disagree strongly  
Disagree  
Disagree slightly  
Neither disagree nor agree  
Agree slightly  
Agree  
Agree strongly

**33. When reading the information about the dangers of not doing enough exercise I felt uncomfortable** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither disagree nor agree  
 Agree slightly  
 Agree  
 Agree strongly

---

### **Final Page**

**Thank you for taking the time to complete this questionnaire.**

In a week's time you will receive an e-mail with a web link to the final questionnaire. Please try and complete the questionnaire as soon as you receive this email.

---

### **Time 3**

**All participants completed the following sections:**

#### **Exercise Questionnaire Time 3**

**Thank you for agreeing to take part in this study.**

**This short questionnaire is about people's thoughts and feelings about exercise.**

This questionnaire is the **final** part of the study.

Participants who complete all three questionnaires will be entered in to a prize draw with the chance of **winning £100!**

**You are welcome to take part if you are:**

Over the age of 18

Fluent in written and spoken English

#### **PLEASE NOTE:**

There are no right or wrong answers to any of the questions. I am interested only in finding out about your thoughts and feelings.

Your answers will be kept confidential.

You are under no obligation to take part in this study. Participation is purely voluntary and you are free to withdraw at any time.

Names and e-mail addresses will be removed from all questionnaires as soon as



the final phase of the study has been completed, and your answers will be stored anonymously from that point.

**Please read the instructions carefully and answer the questions in the order they appear on the page.**

**You will not be able to return to a page once you have clicked the continue button.**

---

**Please answer the following questions**

**Please read the instructions carefully and answer the questions in the order they appear on the page.**

- 1. Please write today's date** *(Optional)*
  - 2. Please write your name** *(Optional)*
  - 3. Please write your e-mail** (This is vital information so you can be contacted if you are the winner of the prize draw. **Please provide the same email address as in the previous questionnaires**). *(Optional)*
- 

### **Exercise**

Now we would like to ask you some questions about exercise. Please note that for the purpose of this study, exercise is defined as:

**"any moderate to vigorous physical activity, performed in your leisure time, that raises your heart rate, and results in you becoming warm and at least mildly out of breath."**

- 4. I have increased the amount I have exercised by at least one extra session (30 minutes or more) over the past 7 days** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

- 5. I engaged in at least one extra session of exercise (30 minutes or more) over the past 7 days.** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**6. In the past seven days on how many days have you engaged in 30 minutes or more of exercise? *(Optional)***

0  
 1  
 2  
 3  
 4  
 5  
 6  
 7

**7. Considering the past 7 day period, how many times have you done the following kinds of exercise for 30 minutes or more during your free time? *(Optional)***

**a. Strenuous Exercise** (heart beats rapidly) (e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance cycling) *(Optional)*

**b. Moderate Exercise** (not exhausting) (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing) *(Optional)*

**c. Mild Exercise** (minimal effort) (e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snowmobiling, easy walking) *(Optional)*

**8. Considering the past 7 day period, during your leisure time, how often have you engaged in any regular activity long enough to work up a sweat (heart beats rapidly)? *(Optional)***

Often  
Sometimes  
Never/Rarely

---

**Final Page**

**Thank you for taking the time to participate in this research.**

You will now be entered in to the prize draw.

## Appendix 2 - Questionnaires referred to in Chapter 3

### Chapter 3

#### Time 1

#### **All participants completed the following sections:**

##### **Thank you for agreeing to take part in this study.**

This questionnaire is the **first part** of our three-part study and I shall be contacting you in a week's time to ask you some further questions, and then again a week later.

Participants who complete all three questionnaires will be entered in to a prize draw with the chance of **winning £100!**

##### **You are welcome to take part if you are:**

Over the age of 18

Fluent in written and spoken English

##### **PLEASE NOTE:**

**In this questionnaire we would like to find out a bit more about you and what you are like.**

There are no right or wrong answers to any of the questions. We are interested only in finding out about your thoughts and feelings.

Your answers will be kept confidential.

You are under no obligation to take part in this study. Participation is purely voluntary and you are free to withdraw at any time.

Names and e-mail addresses will be removed from all files as soon as the final phase of the study has been completed, and your answers will be stored anonymously from that point.

**Please read the instructions carefully and answer the questions in the order they appear on the page.**

**You will not be able to return to a page once you have clicked the continue button.**

**If you wish to take part, please complete the consent form below.**

#### **CONSENT FORM**

**Please select your choice below**

##### **1. ELECTRONIC CONSENT**

Clicking the agree button below indicates that:

**You have read the above information**

**You voluntarily agree to participate**

**You are over 18 years of age**

If you do not wish to participate in this study, please decline participation by clicking the disagree button and then navigate away from this page.

Agree

Disagree

---

About you...

Please answer the following questions

**2. Please enter today's date (dd/mm/yyyy)**  
(DD-MM-YYYY)

**3. Please enter your e-mail** (This is vital information so we can contact you with the second part of the study, and so you can be contacted if you are the winner of the prize draw)

**4. Please enter your name**

**5. Are you male or female?**

**6. What is your age?**

**7. What is your current occupation?**

Student   Employed   Unemployed

Other (please specify):

**8. If you answered student in the previous question, what subject are you studying?**

**9. Please select a country to describe your nationality**

If you selected Other, please specify:

**Are you fluent in English?**

YES   NO

---

**Personal attitudes and characteristics**

Below is a list of statements dealing with **your general feelings about yourself**. Please click the button to the left of the response that represents **how much you agree or disagree with each statement**

**10. On the whole, I am satisfied with myself**

Strongly agree  
Agree  
Disagree  
Strongly disagree

**11. At times, I think I am no good at all**

Strongly agree  
Agree  
Disagree  
Strongly disagree

**12. I feel that I have a number of good qualities**

Strongly agree  
Agree  
Disagree  
Strongly disagree

**13. I am able to do things as well as most other people**

Strongly agree  
Agree  
Disagree  
Strongly disagree

**14. I feel I do not have much to be proud of**

Strongly agree  
Agree  
Disagree  
Strongly disagree

**15. I certainly feel useless at times**

Strongly agree  
Agree  
Disagree  
Strongly disagree

**16. I feel that I'm a person of worth, at least on an equal plane with others**

Strongly agree  
Agree  
Disagree  
Strongly disagree

**17. I wish I could have more respect for myself**

Strongly agree  
Agree  
Disagree  
Strongly disagree

**18. All in all, I am inclined to feel that I am a failure**

Strongly agree  
Agree  
Disagree  
Strongly disagree

**19. I take a positive attitude toward myself**

Strongly agree  
Agree  
Disagree  
Strongly disagree

---

**Personal attitudes and characteristics**

Below is a list of statements dealing with your **general feelings about yourself**. Please click the button to the left of the response that best represents **how much you agree or disagree with each statement**

**20. Sometimes I feel worthless; at other times I feel that I am worthwhile**

Strongly disagree  
Disagree  
Agree  
Strongly agree

**21. Sometimes I feel useless; at other times I feel very useful**

Strongly disagree  
Disagree  
Agree  
Strongly agree

**22. Sometimes I feel happy with myself; at other times I feel very unhappy with myself**

Strongly disagree  
 Disagree  
 Agree  
 Strongly agree

**23. Sometimes I feel very bad about myself; at other times I feel very good about myself**

Strongly disagree  
 Disagree  
 Agree  
 Strongly agree

---

**Personal attitudes and characteristics**

Below is a list of statements dealing with **your general feelings about yourself**. Please click the button to the left of the response that best represents **how much you agree or disagree with each statement**

**24. My beliefs about myself often conflict with one another**

Strongly disagree  
 Disagree  
 Neither disagree nor agree  
 Agree  
 Strongly agree

**25. On one day I might have one opinion of myself and on another day I might have a different opinion**

Strongly disagree  
 Disagree  
 Neither disagree nor agree  
 Agree  
 Strongly agree

**26. I spend a lot of time wondering about what kind of person I really am**

Strongly disagree  
 Disagree  
 Neither disagree nor agree  
 Agree  
 Strongly agree

**27. Sometimes I feel that I am not really the person that I appear to be**

Strongly disagree  
 Disagree  
 Neither disagree nor agree



Agree  
Strongly agree

**28. When I think about the kind of person I have been in the past, I'm not sure what I was really like**

Strongly disagree  
Disagree  
Neither disagree nor agree  
Agree  
Strongly agree

**29. I seldom experience conflict between the different aspects of my personality**

Strongly disagree  
Disagree  
Neither disagree nor agree  
Agree  
Strongly agree

**30. Sometimes I think I know other people better than I know myself**

Strongly disagree  
Disagree  
Neither disagree nor agree  
Agree  
Strongly agree

**31. My beliefs about myself seem to change very frequently**

Strongly disagree  
Disagree  
Neither disagree nor agree  
Agree  
Strongly agree

**32. If I were asked to describe my personality, my description might end up being different from one day to another day**

Strongly disagree  
Disagree  
Neither disagree nor agree  
Agree  
Strongly agree

**33. Even if I wanted to, I don't think I could tell someone what I'm really like**

Strongly disagree  
 Disagree  
 Neither disagree nor agree  
 Agree  
 Strongly agree

**34. In general, I have a clear sense of who I am and what I am**

Strongly disagree  
 Disagree  
 Neither disagree nor agree  
 Agree  
 Strongly agree

**35. It is often hard for me to make up my mind about things because I don't really know what I want**

Strongly disagree  
 Disagree  
 Neither disagree nor agree  
 Agree  
 Strongly agree

**Personal attitudes and characteristics**

Listed below are a number of statements concerning **personal attitudes and characteristics**. Please read each statement carefully and consider the extent to which you think it is **like you**.

Please click the button to the left of the response that best reflects your answer

**36. An important measure of my worth is how competently I perform**

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**37. Even in the face of failure, my feelings of self-worth remain unaffected**

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**38. A big determinant of how much I like myself is how well I perform up to the standards that I have set for myself**

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**39. My overall feelings about myself are heavily influenced by how much other people like and accept me**

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**40. If I get along well with someone, I feel better about myself overall**

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**41. An important measure of my worth is how physically attractive I am**

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**42. My overall feelings about myself are heavily influenced by what I believe other people are saying or thinking about me**

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**43. If I am told I look good, I feel better about myself in general**

Not at all like me  
 Somewhat unlike me  
 Neutral

Somewhat like me  
 Very much like me

**44. My feelings of self-worth are basically unaffected when other people treat me badly**

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**45. An important measure of my worth is how well I perform up to the standards that other people have set for me**

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**46. If I know that someone likes me, I do not let it affect how I feel about myself**

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**47. When my actions do not live up to my expectations, it makes me feel dissatisfied with myself**

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**48. Even on a day when I don't look my best, my feelings of self-worth remain unaffected**

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**49. My overall feelings about myself are heavily influenced by how good I look**

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**50. Even in the face of rejection, my feelings of self-worth remain unaffected**

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**Personal attitudes and characteristics**

Please read each pair of statements below and click the button to the left of the response that **best describes your feelings and beliefs about yourself**.

You may feel that neither statement describes you well, but **please pick the one that comes closest**.

**Please complete all 16 pairs.**

**51. Which one of these two statements best describes your feelings and beliefs about yourself?**

I know I am good because everybody keeps telling me so  
 When people compliment me I sometimes get embarrassed

**52. Which one of these two statements best describes your feelings and beliefs about yourself?**

I like to be the centre of attention  
 I prefer to blend in with the crowd

**53. Which one of these two statements best describes your feelings and beliefs about yourself?**

I think I am a special person  
 I am no better or worse than most people

**54. Which one of these two statements best describes your feelings and beliefs about yourself?**

I like having authority over people  
I don't mind following orders

**55. Which one of these two statements best describes your feelings and beliefs about yourself?**

I find it easy to manipulate people  
I don't like it when I find myself manipulating people

**56. Which one of these two statements best describes your feelings and beliefs about yourself?**

I insist on getting the respect that is due me  
I usually get the respect that I deserve

**57. Which one of these two statements best describes your feelings and beliefs about yourself?**

I am apt to show off if I get the chance  
I try not to be a show off

**58. Which one of these two statements best describes your feelings and beliefs about yourself?**

I always know what I am doing  
Sometimes I am not sure of what I am doing

**59. Which one of these two statements best describes your feelings and beliefs about yourself?**

Everybody likes to hear my stories  
Sometimes I tell good stories

**60. Which one of these two statements best describes your feelings and beliefs about yourself?**

I expect a great deal from other people  
I like to do things for other people

**61. Which one of these two statements best describes your feelings and beliefs about yourself?**

I really like to be the centre of attention  
It makes me uncomfortable to be the centre of attention

**62. Which one of these two statements best describes your feelings and beliefs about yourself?**

People always seem to recognize my authority  
Being an authority does not mean that much to me

**63. Which one of these two statements best describes your feelings and beliefs about yourself?**

I am going to be a great person  
I hope I am going to be successful

**64. Which one of these two statements best describes your feelings and beliefs about yourself?**

I can make anybody believe anything I want them to  
People sometimes believe what I tell them

**65. Which one of these two statements best describes your feelings and beliefs about yourself?**

I am more capable than other people  
There is a lot that I can learn from other people

**66. Which one of these two statements best describes your feelings and beliefs about yourself?**

I am an extraordinary person  
I am much like everybody else

---

**Your name**

**67. How much do you like your name, in total?**

- 1 (Not at all)
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9 (Very much)

**Final Page**

Thank you very much for taking the time to complete this questionnaire.

**In a week's time you will receive an e-mail with a web link to the second questionnaire.**

**Please try and complete the questionnaire as soon as you receive this email.**

**Time 2**

**All participants completed the following sections:**

Thank you for agreeing to take part in this study.

**This questionnaire is about people's thoughts and feelings about exercise.**

This questionnaire is the second part of our three-part study and I shall be contacting you in a week's time to ask you some final questions.

Participants who complete all three questionnaires will be entered in to the prize draw with a chance of winning £100!

**PLEASE NOTE:**

There are no right or wrong answers to any of the questions. We are interested only in finding out about your thoughts and feelings.

Your answers will be kept confidential.

You are under no obligation to take part in this study. Participation is purely voluntary and you are free to withdraw at any time.

Names and e-mail addresses will be removed from all files as soon as the final phase of the study has been completed, and your answers will be stored anonymously from that point.

**Please read the instructions carefully and answer the questions in the order they appear on the page.**

**You will not be able to return to a page once you have clicked the continue button.**

**If you wish to take part, please complete the consent form below.**

**CONSENT FORM**

Please select your choice below

**1. ELECTRONIC CONSENT**

Clicking the agree button below indicates that:

**You have read the above information**

**You voluntarily agree to participate**

**You are over 18 years of age**

If you do not wish to participate in this study, please decline participation by clicking the disagree button and then navigate away from this page. (Optional)



Agree  
Disagree

---

**Please answer the following questions**

**2. Please enter today's date (dd/mm/yyyy)**

(DD-MM-YYYY)

**3. Please enter your e-mail** (This is vital information so you can be contacted if you are the winner of the prize draw. Please provide the same e-mail as in the previous questionnaire)

**4. Please enter your name**

---

### **Exercise**

Now I'd like to ask you some questions about exercise. Please note that for the purpose of this study, exercise is defined as:

**"any moderate to vigorous physical activity, performed in your leisure time, that raises your heart rate, and results in you becoming warm and at least mildly out of breath."**

**5. In the past seven days on how many days have you exercised for 30 minutes or more?**

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7

**6. In the average week, on how many days do you exercise for 30 minutes or more?**

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7

**7. Considering the past 7 day period, how many times have you done the following kinds of exercise for 30 minutes or more during your free time?**

**a.** Strenuous Exercise (heart beats rapidly) (e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance cycling)

**b.** Moderate Exercise (not exhausting) (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

**c.** Mild Exercise (minimal effort) (e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snowmobiling, easy walking)

**8. Considering the past 7 day period, during your leisure time, how often have you engaged in any regular activity long enough to work up a sweat (heart beats rapidly)?**

Often

Sometimes

Never/Rarely

---

**Participants in the self-affirmation condition completed the following section:**

**Your values**

*Altruism*

*Spontaneity*

*Forgiveness*

*Loyalty*

*Honesty*

*Goodness*

*Religiousness*

*Tolerance*

*Creativity*

*Sincerity*

*Fairness*

*Resourcefulness*

**9. Please select the value from the list above that is most important to you personally, and write it in the space provided below. If more than one value is equally important to you then please select just one to write about.**

The most important value to me is:...

**10. In the space below please write a short statement (around 2-3 sentences) about why this value is important to you. Take a couple of minutes to think about this value and how this value has influenced things that you have done. Please write about how you use this value in your everyday life.**

---

**Participants in control condition completed the following section:  
Your values**

*Altruism*

*Spontaneity*

*Forgiveness*

*Loyalty*

*Honesty*

*Goodness*

*Religiousness*

*Tolerance*

*Creativity*

*Sincerity*

*Fairness*

*Resourcefulness*

**9. Please select the value from the list above that is **least** important to you personally, and write it in the space provided. If more than one value is equally unimportant to you then please select just one to write about.**

The **least** important value to me is:...

**10.** In the space below please write a short statement (around 2-3 sentences) about why this value might be important to someone else, and how this value might influence their everyday life.

**All participants then completed the following sections:**

**11. How important to you is the value that you selected to write about?**

Extremely unimportant  
Unimportant  
Slightly unimportant  
Neither unimportant nor important  
Slightly important  
Important  
Extremely important

---

**Please now read the following information about exercise carefully**

Exercise is an **ESSENTIAL** part of a healthy lifestyle and if you don't do enough exercise you put yourself at risk of developing many serious health problems.

**For example, if you do not do enough exercise, compared to those who do, you are:**

- **TWICE** as likely to develop **HEART DISEASE** and **TYPE 2 DIABETES**
  - **TWICE** as likely to develop **COLON CANCER**
  - **30 - 40%** more likely to develop **BREAST CANCER**
  - at an **INCREASED risk** of developing **ANXIETY, DEPRESSION** and **DEMENTIA** in later life
- 

People who do not exercise sufficiently are **MORE LIKELY TO DIE YOUNGER.**

Being physically unfit is **JUST AS DANGEROUS AS SMOKING** in terms of lowering life expectancy.

Physical inactivity increases the risk of **PREMATURE DEATH** by up to **30%**.

---

**It's EASY to increase the amount you exercise**

**Some people think exercise is too expensive or simply takes up too much time.**

In reality, it is easy to increase the amount you exercise and many forms of exercise are free.

**If you can find a little spare time, there are many ways to fit in some exercise and it is possible to find something to suit any kind of lifestyle.**

The key is to do activities that you enjoy and that you can do regularly.

---

**There are many different ways to exercise:**

**walking, dancing, aerobics, running, cycling or playing football to name but a few -**

and almost everyone can find some form of exercise that they will really enjoy.

With all the different options out there, **YOU** can find the form of exercise that **YOU** enjoy doing!

---

**IT'S UP TO YOU!**

**The National guidelines** recommend exercising for **30 MINUTES OR MORE** on at least **5 DAYS OF THE WEEK**

**Go on - it's up to YOU to make a change!**

---

**Please answer the following questions about your thoughts and feelings about exercise**

Please click on the button to the left of the response that represents how you feel

**12. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be**

Extremely bad  
 Bad  
 Slightly bad  
 Neither bad nor good  
 Slightly good  
 Good  
 Extremely good

**13. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be**

Extremely harmful  
 Harmful  
 Slightly harmful

Neither harmful nor beneficial  
 Slightly beneficial  
 Beneficial  
 Extremely beneficial

**14. I intend to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**15. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be**

Extremely unpleasant  
 Unpleasant  
 Slightly unpleasant  
 Neither unpleasant nor pleasant  
 Slightly pleasant  
 Pleasant  
 Extremely pleasant

**16. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be**

Extremely unenjoyable  
 Unenjoyable  
 Slightly unenjoyable  
 Neither unenjoyable nor enjoyable  
 Slightly enjoyable  
 Enjoyable  
 Extremely enjoyable

**17. If I increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days it will improve my health**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**18. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be**

Extremely worthless  
 Worthless  
 Slightly worthless  
 Neither worthless nor valuable  
 Slightly valuable  
 Valuable  
 Extremely valuable

**19. If I wanted to I could increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**20. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be**

Extremely impossible  
 Impossible  
 Slightly impossible  
 Neither impossible nor possible  
 Slightly possible  
 Possible  
 Extremely possible

**21. I will try to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**22. I believe I have complete control over increasing the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**23. I plan to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**24. It is mostly up to me whether I increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**25. Increasing the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be an effective way to improve my health**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**26. I thought the information about the dangers of not doing enough exercise was overblown**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither disagree nor agree



Agree slightly  
 Agree  
 Agree strongly

**27. I thought the information about the dangers of not doing enough exercise was exaggerated**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither disagree nor agree  
 Agree slightly  
 Agree  
 Agree strongly

**28. I thought the information about the dangers of not doing enough exercise tried to manipulate my feelings**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither disagree nor agree  
 Agree slightly  
 Agree  
 Agree strongly

**29. I thought the information about the dangers of not doing enough exercise tried to strain the truth**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither disagree nor agree  
 Agree slightly  
 Agree  
 Agree strongly

---

**Final Page**

**Thank you for taking the time to complete this questionnaire.**

In a week's time you will receive an e-mail with a web link to the final questionnaire. Please try and complete the questionnaire as soon as you receive this email.

---

**All participants completed the following sections:**

**Thank you for agreeing to take part in this study.**

**This short questionnaire is about people's thoughts and feelings about exercise.**

This questionnaire is the **final** part of the study.

Participants who complete all three questionnaires will be entered in to a prize draw with the chance of winning £100!

**You are welcome to take part if you are:**

Over the age of 18

Fluent in written and spoken English

**PLEASE NOTE:**

There are no right or wrong answers to any of the questions. I am interested only in finding out about your thoughts and feelings.

Your answers will be kept confidential.

You are under no obligation to take part in this study. Participation is purely voluntary and you are free to withdraw at any time.

Names and e-mail addresses will be removed from all questionnaires as soon as the final phase of the study has been completed, and your answers will be stored anonymously from that point.

**Please read the instructions carefully and answer the questions in the order they appear on the page.**

**You will not be able to return to a page once you have clicked the continue button.**

**If you wish to take part, please complete the consent form below.**

**Consent form**

**Please select your choice below**

1. ELECTRONIC CONSENT

Clicking the agree button below indicates that:

**You have read the above information**

**You voluntarily agree to participate**

**You are over 18 years of age**

If you do not wish to participate in this study, please decline participation by clicking the disagree button and then navigate away from this page

Agree

Disagree

---

### **Please answer the following questions**

Please read the instructions carefully and answer the questions in the order they appear on the page.

**2. Please write today's date  
(DD-MM-YYYY)**

**3. Please write your name**

**4. Please write your e-mail** (This is vital information so you can be contacted if you are the winner of the prize draw. Please provide the same email address as in the previous questionnaires).

---

### **Exercise**

Now we would like to ask you some questions about exercise. Please note that for the purpose of this study, exercise is defined as:

**"any moderate to vigorous physical activity, performed in your leisure time, that raises your heart rate, and results in you becoming warm and at least mildly out of breath."**

**5. I have increased the amount I have exercised by at least one extra session (30 minutes or more) over the past 7 days**

Disagree strongly

Disagree

Disagree slightly

Neither agree nor disagree

Agree slightly

Agree

Agree strongly

**6. I engaged in at least one extra session of exercise (30 minutes or more) over the past 7 days.**

Disagree strongly

Disagree

Disagree slightly

Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**7. In the past seven days on how many days have you exercised for 30 minutes or more?**

0  
 1  
 2  
 3  
 4  
 5  
 6  
 7

**8. Considering the past 7 day period, how many times have you done the following kinds of exercise for 30 minutes or more during your free time?**

**a.** Strenuous Exercise (heart beats rapidly) (e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance cycling)

**b.** Moderate Exercise (not exhausting) (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

**c.** Mild Exercise (minimal effort) (e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snowmobiling, easy walking)

**9. Considering the past 7 day period, during your leisure time, how often have you engaged in any regular activity long enough to work up a sweat (heart beats rapidly)?**

Often  
 Sometimes  
 Never/Rarely

---

**Final Page**

**Thank you for taking the time to participate in this research.**

You will now be entered in to the prize draw.

## Appendix 3 - Questionnaires referred to in Chapter 4

### Chapter 4

#### Time 1

**All participants completed the following sections:**

Thank you for agreeing to take part in this study about personality.

Participation in this study entails completing three online questionnaires. This questionnaire is the first part and should only take around 10 minutes to complete. I shall be contacting you in a week's time to ask you some further questions, and then again a week later.

Participants who complete all three questionnaires will be entered in to a prize draw with the chance of winning £100!

**You are welcome to take part if you are:**

Over the age of 18

Fluent in written and spoken English

**PLEASE NOTE:**

You are under no obligation to take part in this study. Participation is purely voluntary and you are free to withdraw at any time until it is no longer practical for you to do so.

All of the information that you give will be treated confidentially.

Your name and e-mail address will be deleted from all files once the prize draw has been conducted and your answers will be stored anonymously from that point onwards.

Your email address will only be used to contact you for the purpose of this study.

**Please read the instructions carefully and answer the questions in the order they appear on the page.**

**You will not be able to return to a page once you have clicked the continue button.**

**By clicking on the "Continue" button, you are indicating that:**

- You consent to the processing of your personal information for the purposes of this research study.
  - You understand that such information will be treated as strictly confidential and handled in accordance with the Data Protection Act 1998.
-

### About you...

**Please answer the following questions**

**2. Please enter today's date (dd/mm/yyyy) (Optional)**

(DD-MM-YYYY)

**3. Please enter your e-mail (This is vital information so we can contact you with the second part of the study, and so you can be contacted if you are the winner of the prize draw) (Optional)**

**4. Please enter your name**

(Optional)

**5. Are you male or female? (Optional)**

Male Female

**6. What is your age? (Optional)**

**7. What is your current occupation?**

(Optional)

Student Employed Unemployed

Other (please specify):

**8. If you answered student in the previous question, what subject are you studying? (Optional)**

**9. Please select a country to describe your nationality (Optional)**

If you selected Other, please specify:

**Are you fluent in English?**

(Optional)

YES NO

---

### Personal attitudes and characteristics

Below is a list of statements dealing with **your general feelings about yourself**. Please click the button to the left of the response that represents **how much you agree or disagree with each statement**

**10. On the whole, I am satisfied with myself (Optional)**

Strongly agree

Agree

Disagree

Strongly disagree

**11. At times, I think I am no good at all (Optional)**

Strongly agree  
Agree  
Disagree  
Strongly disagree

**12. I feel that I have a number of good qualities** *(Optional)*

Strongly agree  
Agree  
Disagree  
Strongly disagree

**13. I am able to do things as well as most other people** *(Optional)*

Strongly agree  
Agree  
Disagree  
Strongly disagree

**14. I feel I do not have much to be proud of** *(Optional)*

Strongly agree  
Agree  
Disagree  
Strongly disagree

**15. I certainly feel useless at times** *(Optional)*

Strongly agree  
Agree  
Disagree  
Strongly disagree

**16. I feel that I'm a person of worth, at least on an equal plane with others** *(Optional)*

Strongly agree  
Agree  
Disagree  
Strongly disagree

**17. I wish I could have more respect for myself** *(Optional)*

Strongly agree  
Agree  
Disagree  
Strongly disagree

**18. All in all, I am inclined to feel that I am a failure** *(Optional)*

Strongly agree  
 Agree  
 Disagree  
 Strongly disagree

**19. I take a positive attitude toward myself** *(Optional)*

Strongly agree  
 Agree  
 Disagree  
 Strongly disagree

---

## Personal attitudes and characteristics

Listed below are a number of statements concerning **personal attitudes and characteristics**. Please read each statement carefully and consider the extent to which you think it is **like you**.

Please click the button to the left of the response that best **reflects your answer**

**20. An important measure of my worth is how competently I perform** *(Optional)*

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**21. Even in the face of failure, my feelings of self-worth remain unaffected**  
*(Optional)*

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**22. A big determinant of how much I like myself is how well I perform up to the standards that I have set for myself** *(Optional)*

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**23. My overall feelings about myself are heavily influenced by how much other people like and accept me** *(Optional)*



Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**24. If I get along well with someone, I feel better about myself overall** *(Optional)*

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**25. An important measure of my worth is how physically attractive I am**  
*(Optional)*

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**26. My overall feelings about myself are heavily influenced by what I believe other people are saying or thinking about me** *(Optional)*

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**27. If I am told I look good, I feel better about myself in general** *(Optional)*

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**28. My feelings of self-worth are basically unaffected when other people treat me badly** *(Optional)*

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**29. An important measure of my worth is how well I perform up to the standards that other people have set for me** *(Optional)*

Not at all like me  
Somewhat unlike me  
Neutral  
Somewhat like me  
Very much like me

**30. If I know that someone likes me, I do not let it affect how I feel about myself** *(Optional)*

Not at all like me  
Somewhat unlike me  
Neutral  
Somewhat like me  
Very much like me

**31. When my actions do not live up to my expectations, it makes me feel dissatisfied with myself** *(Optional)*

Not at all like me  
Somewhat unlike me  
Neutral  
Somewhat like me  
Very much like me

**32. Even on a day when I don't look my best, my feelings of self-worth remain unaffected** *(Optional)*

Not at all like me  
Somewhat unlike me  
Neutral  
Somewhat like me  
Very much like me

**33. My overall feelings about myself are heavily influenced by how good I look** *(Optional)*

Not at all like me  
Somewhat unlike me  
Neutral  
Somewhat like me  
Very much like me

**34. Even in the face of rejection, my feelings of self-worth remain unaffected** *(Optional)*

Not at all like me  
Somewhat unlike me

Neutral  
 Somewhat like me  
 Very much like me

### **Final Page**

Thank you very much for taking the time to complete this questionnaire.

In a week's time you will receive an e-mail with a web link to the second questionnaire.

Please try and complete the questionnaire as soon as you receive this email.

---

## **Time 2**

**There are 6 conditions at Time 2. The first pages are identical for all conditions and consist of:**

Thank you for taking part in this study about people's thoughts and feelings about exercise.

This questionnaire should take around 10-15 minutes to complete and is the second part of this three-part study. I shall be contacting you in a week's time to ask you some final questions.

**Participants who complete all three questionnaires will be entered in to a prize draw with the chance of winning £100!**

**You are welcome to take part if you are:**

Over the age of 18

Fluent in written and spoken English

### **PLEASE NOTE:**

You are under no obligation to take part in this study. Participation is purely voluntary and you are free to withdraw at any time until it is no longer practical for you to do so.

All of the information that you give will be treated confidentially.

Your name and e-mail address will be deleted from all files once the prize draw has been conducted and your answers will be stored anonymously from that point onwards.

Your email address will only be used to contact you for the purpose of this study.

Please read the instructions carefully and answer the questions in the order they appear on the page.

You will not be able to return to a page once you have clicked the continue button.

**By clicking on the "Continue" button, you are indicating that:**

- You consent to the processing of your personal information for the purposes of this

research study.

- You understand that such information will be treated as strictly confidential and handled in accordance with the Data Protection Act 1998.

---

**Please answer the following questions**

**2. Please enter today's date (dd/mm/yyyy) (Optional)**

(DD-MM-YYYY)

**3. Please enter your e-mail (This is vital information so you can be contacted if you are the winner of the prize draw. Please provide the same e-mail as in the previous questionnaire) (Optional)**

**4. Please enter your name**

(Optional)

---

**Exercise**

Now I'd like to ask you some questions about exercise. Please note that for the purpose of this study, exercise is defined as:

**"any moderate to vigorous physical activity, performed in your leisure time, that raises your heart rate, and results in you becoming warm and at least mildly out of breath."**

**5. In the past seven days on how many days have you exercised for 30 minutes or more? (Optional)**

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7

**6. In the average week, on how many days do you exercise for 30 minutes or more? (Optional)**

- 0
- 1
- 2
- 3
- 4
- 5

6  
7

**7. Considering the past 7 day period, how many times have you done the following kinds of exercise for 30 minutes or more during your free time? (*Optional*)**

**a. Strenuous Exercise** (heart beats rapidly) (e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance cycling)

(*Optional*)

**b. Moderate Exercise** (not exhausting) (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

(*Optional*)

**c. Mild Exercise** (minimal effort) (e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snowmobiling, easy walking)

(*Optional*)

**8. Considering the past 7 day period, during your leisure time, how often have you engaged in any regular activity long enough to work up a sweat (heart beats rapidly)? (*Optional*)**

Often

Sometimes

Never/Rarely

---

**Participants then went on to complete ONE of these manipulations:**

**Condition 1: High CSE prime + Self-affirmation**

**Condition 2: High CSE prime + Control**

**Condition 3: Low CSE prime + Self-affirmation**

**Condition 4: Low CSE prime + Control**

**Condition 5: Self-affirmation**

**Condition 6: Control**

---

**(High CSE prime)**

**Visualisation task**

**We now want you to visualise the following situation. Try to imagine that it is happening to you right now, and think about how you would react and feel in this situation.**

**You are meeting and chatting with a new acquaintance about a class/work assignment that you are both working on.**

**A few minutes later you accidentally overhear this person saying to someone else about you:**

*"S/he was really smart....I really like people like that."*

**Imagine this situation in as much detail as possible and how it would make you feel.**

---

## **(Low CSE prime)**

### **Visualisation task**

**We now want you to visualise the following situation. Try to imagine that it is happening to you right now, and think about how you would react and feel in this situation.**

**You are having lunch with a good friend. This is a friend who would stick by you, through good times and bad. Feel the warmth and acceptance with this person.**

**Imagine this situation in as much detail as possible and how it would make you feel.**

---

## **(Control) Your values**

*Altruism*

*Spontaneity*

*Forgiveness*

*Loyalty*

*Honesty*

*Goodness*

*Religiousness*

*Tolerance*

*Creativity*

*Sincerity*

*Fairness*

*Resourcefulness*

**9.** Please select the value from the list above that is **least** important to you personally, and write it in the space provided. If more than one value is equally unimportant to you then please select just one to write about.

The **least** important value to me is:... (*Optional*)

**10.** In the space below please write a short statement (around 2-3 sentences) about why this value might be important to someone else, and how this value might influence their everyday life. (*Optional*)

---

## **(Self-affirmation) Your values**

*Altruism*

*Spontaneity*

*Forgiveness*

*Loyalty*

*Honesty*

*Goodness*

*Religiousness*

*Tolerance*

*Creativity*

*Sincerity*

*Fairness*

*Resourcefulness*

**9.** Please select the value from the list above that is **most** important to you personally, and write it in the space provided below. If more than one value is equally important to you then please select just one to write about.

The **most** important value to me is:... (*Optional*)

**10.** In the space below please write a short statement (around 2-3 sentences) about why this value is important to you. Take a couple of minutes to think about this value and how this value has influenced things that you have done. Please write about how you use this value in your everyday life. (*Optional*)

---

**All participants then completed the following questions in all conditions:**

**11. How important to you is the value that you selected to write about? (*Optional*)**

Extremely unimportant  
 Unimportant  
 Slightly unimportant  
 Neither unimportant nor important  
 Slightly important  
 Important  
 Extremely important

---

**Please now read the following information about exercise carefully**

Exercise is an **ESSENTIAL** part of a healthy lifestyle and if you don't do enough exercise you put yourself at risk of developing many serious health problems.

**For example, if you do not do enough exercise, compared to those who do, you are:**

- **TWICE** as likely to develop **HEART DISEASE and TYPE 2 DIABETES**
  - **TWICE** as likely to develop **COLON CANCER**
  - **30 - 40%** more likely to develop **BREAST CANCER**
  - at an **INCREASED risk** of developing **ANXIETY, DEPRESSION and DEMENTIA** in later life
- 

People who do not exercise sufficiently are **MORE LIKELY TO DIE YOUNGER.**

Being physically unfit is **JUST AS DANGEROUS AS SMOKING** in terms of lowering life expectancy.

Physical inactivity increases the risk of **PREMATURE DEATH** by up to **30%.**

---



## **It's EASY to increase the amount you exercise**

**Some people think exercise is too expensive or simply takes up too much time.**

In reality, it is easy to increase the amount you exercise and many forms of exercise are free.

**If you can find a little spare time, there are many ways to fit in some exercise and it is possible to find something to suit any kind of lifestyle.**

The key is to do activities that you enjoy and that you can do regularly.

**There are many different ways to exercise:**

**walking, dancing, aerobics, running, cycling or playing football to name but a few -**

and almost everyone can find some form of exercise that they will really enjoy.

With all the different options out there, **YOU** can find the form of exercise that **YOU** enjoy doing!

---

## **IT'S UP TO YOU!**

**The National guidelines** recommend exercising for **30 MINUTES OR MORE** on at least **5 DAYS OF THE WEEK**

Go on - it's up to YOU to make a change!

---

**Please answer the following questions about your thoughts and feelings about exercise**

**Please click on the button to the left of the response that represents how you feel**

**12. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be** *(Optional)*

Extremely bad  
Bad  
Slightly bad  
Neither bad nor good  
Slightly good  
Good  
Extremely good

**13. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be** *(Optional)*

Extremely harmful  
Harmful  
Slightly harmful  
Neither harmful nor beneficial

Slightly beneficial  
Beneficial  
Extremely beneficial

**14. I intend to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days** *(Optional)*

Disagree strongly  
Disagree  
Disagree slightly  
Neither agree nor disagree  
Agree slightly  
Agree  
Agree strongly

**15. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be** *(Optional)*

Extremely unpleasant  
Unpleasant  
Slightly unpleasant  
Neither unpleasant nor pleasant  
Slightly pleasant  
Pleasant  
Extremely pleasant

**16. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be** *(Optional)*

Extremely unenjoyable  
Unenjoyable  
Slightly unenjoyable  
Neither unenjoyable nor enjoyable  
Slightly enjoyable  
Enjoyable  
Extremely enjoyable

**17. If I increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days it will improve my health** *(Optional)*

Disagree strongly  
Disagree  
Disagree slightly  
Neither agree nor disagree  
Agree slightly  
Agree  
Agree strongly

**18. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be** *(Optional)*

Extremely worthless  
 Worthless  
 Slightly worthless  
 Neither worthless nor valuable  
 Slightly valuable  
 Valuable  
 Extremely valuable

**19. If I wanted to I could increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**20. For me to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be** *(Optional)*

Extremely impossible  
 Impossible  
 Slightly impossible  
 Neither impossible nor possible  
 Slightly possible  
 Possible  
 Extremely possible

**21. I will try to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**22. I believe I have complete control over increasing the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly

Agree  
Agree strongly

**23. I plan to increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days** *(Optional)*

Disagree strongly  
Disagree  
Disagree slightly  
Neither agree nor disagree  
Agree slightly  
Agree  
Agree strongly

**24. It is mostly up to me whether I increase the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days** *(Optional)*

Disagree strongly  
Disagree  
Disagree slightly  
Neither agree nor disagree  
Agree slightly  
Agree  
Agree strongly

**25. Increasing the amount I exercise by at least one extra session of exercise (30 minutes or more) over the next 7 days would be an effective way to improve my health** *(Optional)*

Disagree strongly  
Disagree  
Disagree slightly  
Neither agree nor disagree  
Agree slightly  
Agree  
Agree strongly

**26. I thought the information about the dangers of not doing enough exercise was overblown** *(Optional)*

Disagree strongly  
Disagree  
Disagree slightly  
Neither disagree nor agree  
Agree slightly  
Agree  
Agree strongly

**27. I thought the information about the dangers of not doing enough exercise was exaggerated** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither disagree nor agree  
 Agree slightly  
 Agree  
 Agree strongly

**28. I thought the information about the dangers of not doing enough exercise tried to manipulate my feelings** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither disagree nor agree  
 Agree slightly  
 Agree  
 Agree strongly

**29. I thought the information about the dangers of not doing enough exercise tried to strain the truth** *(Optional)*

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither disagree nor agree  
 Agree slightly  
 Agree  
 Agree strongly

---

**Please answer the questions below**

**Please answer the questions below by clicking the button to the left of the response that best reflects how you feel**

**30. How do you currently feel about yourself?** *(Optional)*

Extremely bad  
 Bad  
 Somewhat bad  
 Neutral  
 Somewhat good  
 Good  
 Extremely good

**31. What is your current mood?** *(Optional)*

Extremely sad  
 Sad  
 Somewhat sad

Neutral  
 Somewhat happy  
 Happy  
 Extremely happy

---

### **Final Page**

Thank you very much for taking the time to complete this questionnaire.

**In a week's time you will receive an e-mail with a web link to the final questionnaire. Please try and complete the questionnaire as soon as you receive this email.**

**If you would like more information about how to increase the amount you exercise you may find the following website useful:  
[http://hcd2.bupa.co.uk/fact\\_sheets/html/exercise.html](http://hcd2.bupa.co.uk/fact_sheets/html/exercise.html)**

**If you have any questions about the study please contact me (Camilla During) via email ([c.during@sussex.ac.uk](mailto:c.during@sussex.ac.uk)).**

### **Time 3**

#### **All participants completed the following sections:**

Thank you for taking part in this study about people's thoughts and feelings about exercise.

This questionnaire is the **final part** of the study. It should only take around a couple of minutes to complete.

Participants who complete all three questionnaires will be entered in to a prize draw with the chance of winning £100!

**You are welcome to take part if you are:**

**Over the age of 18**

**Fluent in written and spoken English**

#### **PLEASE NOTE:**

You are under no obligation to take part in this study. Participation is purely voluntary and you are free to withdraw at any time until it is no longer practical for you to do so.

All of the information that you give will be treated confidentially.

Your name and e-mail address will be deleted from all files once the prize draw has been conducted and your answers will be stored anonymously from that point onwards.

Your email address will only be used to contact you for the purpose of this study.

**Please read the instructions carefully and answer the questions in the order they appear on the page.**

**You will not be able to return to a page once you have clicked the continue button.**

**By clicking on the "Continue" button, you are indicating that:**

- You consent to the processing of your personal information for the purposes of this research study.
  - You understand that such information will be treated as strictly confidential and handled in accordance with the Data Protection Act 1998.
- 

**Please answer the following questions**

**Please read the instructions carefully and answer the questions in the order they appear on the page.**

**2. Please write today's date** *(Optional)*  
(DD-MM-YYYY)

**3. Please write your name** *(Optional)*

**4. Please write your e-mail** (This is vital information so you can be contacted if you are the winner of the prize draw. **Please provide the same email address as in the previous questionnaires**). *(Optional)*

---

### **Exercise**

Now we would like to ask you some questions about exercise. Please note that for the purpose of this study, exercise is defined as:

**"any moderate to vigorous physical activity, performed in your leisure time, that raises your heart rate, and results in you becoming warm and at least mildly out of breath."**

**5. I have increased the amount I have exercised by at least one extra session (30 minutes or more) over the past 7 days** *(Optional)*

Disagree strongly

Disagree

Disagree slightly

Neither agree nor disagree

Agree slightly

Agree

Agree strongly

**6. I engaged in at least one extra session of exercise (30 minutes or more) over the past 7 days. (Optional)**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**7. In the past seven days on how many days have you exercised for 30 minutes or more? (Optional)**

0  
 1  
 2  
 3  
 4  
 5  
 6  
 7

**8. Considering the past 7 day period, how many times have you done the following kinds of exercise for 30 minutes or more during your free time? (Optional)**

**a.** Strenuous Exercise (heart beats rapidly) (e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance cycling) (Optional)

**b.** Moderate Exercise (not exhausting) (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing) (Optional)

**c.** Mild Exercise (minimal effort) (e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snowmobiling, easy walking) (Optional)

**9. Considering the past 7 day period, during your leisure time, how often have you engaged in any regular activity long enough to work up a sweat (heart beats rapidly)? (Optional)**

Often  
 Sometimes  
 Never/Rarely



Thank you for taking part in our study about exercise.

This study was designed to explore whether thinking about someone who likes you unconditionally would influence your responses to information about exercise. Therefore some of you were asked to visualise an encounter with a friend who liked you unconditionally, while some of you were asked to visualise an encounter with someone who liked you because you were smart. Some of you did not perform a visualisation task.

We were also interested in exploring whether writing about a personally important value would influence responses to the information about exercise. Therefore some of you were asked to write about an important value before reading this information and some of you were asked to write about an unimportant value. You all then answered the same questions about exercise.

In addition, we were interested in exploring how your self-esteem might influence your responses to the information about exercise. Therefore, the first questionnaire asked you a number of questions designed to assess your self-esteem.

If you would like to withdraw your questionnaire now that you know the purpose of the study and/or you would like more information about this study, please contact me (Camilla During) via email ([c.during@sussex.ac.uk](mailto:c.during@sussex.ac.uk)).

**If you would like more information about how to increase the amount you exercise you may find the following website useful:**

[http://hcd2.bupa.co.uk/fact\\_sheets/html/exercise.html](http://hcd2.bupa.co.uk/fact_sheets/html/exercise.html)

**Again, thank you very much for taking part in this study!**

## Appendix 4 - Questionnaires referred to in Chapter 5

### Chapter 5

#### Time 1

**All participants completed the following sections:**

#### **Questionnaire Time 1**

**Thank you for agreeing to take part in this study**

Participation in this study entails completing three online questionnaires. This questionnaire is the **first** part of our **three-part** study and I shall be contacting you in a week's time to ask you some further questions, and then again a week after that.

In this first questionnaire you will be asked some questions about your personality. This

questionnaire will take you about 5 minutes to complete.

Participants who complete both questionnaires will be entered in to a prize draw with the chance of winning **£100!**

**You are welcome to take part if you are:**

FEMALE

Over the age of 18

Fluent in written and spoken English

**PLEASE NOTE:**

You are under no obligation to take part in this study. Participation is purely voluntary and you are free to withdraw at any time until it is no longer practical for you to do so.

All of the information that you give will be treated confidentially.

Your name and e-mail address will be deleted from all files once the prize draw has been conducted and your answers will be stored anonymously from that point onwards.

Your email address will only be used to contact you for the purpose of this study.

**Please read the instructions carefully and answer the questions in the order they appear on the page.**

**You will not be able to return to a page once you have clicked the continue button.**

**By clicking on the "Continue" button, you are indicating that:**

- You consent to the processing of your personal information for the purposes of this research study.
- You understand that such information will be treated as strictly confidential and handled in accordance with the Data Protection Act 1998.

**About you...**

**Please answer the following questions**

**1. Please enter today's date (dd/mm/yyyy) (*Optional*)**

(DD-MM-YYYY)

**2. Please enter your e-mail (This is vital information so we can contact you with the second part of the study, and so you can be contacted if you are the winner of the prize draw) (*Optional*)**

**3. Please enter your name**

(*Optional*)

**4. Are you male or female? (*Optional*)**

Male Female

**5. What is your age?** *(Optional)*

**6. What is your current occupation?**

*(Optional)*

Student Employed Unemployed

Other *(please specify)*:

**7. If you answered student in the previous question, what subject are you studying?** *(Optional)*

**8. Please select a country to describe your nationality** *(Optional)*

If you selected Other, please specify:

**Are you fluent in English?**

*(Optional)*

YES NO

---

## Personal attitudes and characteristics

Below is a list of statements dealing with **your general feelings about yourself**. Please click the button to the left of the response that represents **how much you agree or disagree with each statement**

**9. On the whole, I am satisfied with myself** *(Optional)*

Strongly agree

Agree

Disagree

Strongly disagree

**10. At times, I think I am no good at all** *(Optional)*

Strongly agree

Agree

Disagree

Strongly disagree

**11. I feel that I have a number of good qualities** *(Optional)*

Strongly agree

Agree

Disagree

Strongly disagree

**12. I am able to do things as well as most other people** *(Optional)*

Strongly agree  
Agree  
Disagree  
Strongly disagree

**13. I feel I do not have much to be proud of** *(Optional)*

Strongly agree  
Agree  
Disagree  
Strongly disagree

**14. I certainly feel useless at times** *(Optional)*

Strongly agree  
Agree  
Disagree  
Strongly disagree

**15. I feel that I'm a person of worth, at least on an equal plane with others** *(Optional)*

Strongly agree  
Agree  
Disagree  
Strongly disagree

**16. I wish I could have more respect for myself** *(Optional)*

Strongly agree  
Agree  
Disagree  
Strongly disagree

**17. All in all, I am inclined to feel that I am a failure** *(Optional)*

Strongly agree  
Agree  
Disagree  
Strongly disagree

**18. I take a positive attitude toward myself** *(Optional)*

Strongly agree  
Agree  
Disagree  
Strongly disagree

---

## Personal attitudes and characteristics

Listed below are a number of statements concerning **personal attitudes and characteristics**. Please read each statement carefully and consider the extent to which you think it is **like you**.

Please click the button to the left of the response that best **reflects your answer**

### **19. An important measure of my worth is how competently I perform** *(Optional)*

Not at all like me  
Somewhat unlike me  
Neutral  
Somewhat like me  
Very much like me

### **20. Even in the face of failure, my feelings of self-worth remain unaffected** *(Optional)*

Not at all like me  
Somewhat unlike me  
Neutral  
Somewhat like me  
Very much like me

### **21. A big determinant of how much I like myself is how well I perform up to the standards that I have set for myself** *(Optional)*

Not at all like me  
Somewhat unlike me  
Neutral  
Somewhat like me  
Very much like me

### **22. My overall feelings about myself are heavily influenced by how much other people like and accept me** *(Optional)*

Not at all like me  
Somewhat unlike me  
Neutral  
Somewhat like me  
Very much like me

### **23. If I get along well with someone, I feel better about myself overall** *(Optional)*

Not at all like me  
Somewhat unlike me  
Neutral  
Somewhat like me  
Very much like me

**24. An important measure of my worth is how physically attractive I am**  
*(Optional)*

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**25. My overall feelings about myself are heavily influenced by what I believe other people are saying or thinking about me** *(Optional)*

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**26. If I am told I look good, I feel better about myself in general** *(Optional)*

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**27. My feelings of self-worth are basically unaffected when other people treat me badly** *(Optional)*

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**28. An important measure of my worth is how well I perform up to the standards that other people have set for me** *(Optional)*

Not at all like me  
 Somewhat unlike me  
 Neutral  
 Somewhat like me  
 Very much like me

**29. If I know that someone likes me, I do not let it affect how I feel about myself**  
*(Optional)*

Not at all like me  
 Somewhat unlike me  
 Neutral

Somewhat like me  
Very much like me

**30. When my actions do not live up to my expectations, it makes me feel dissatisfied with myself** *(Optional)*

Not at all like me  
Somewhat unlike me  
Neutral  
Somewhat like me  
Very much like me

**31. Even on a day when I don't look my best, my feelings of self-worth remain unaffected** *(Optional)*

Not at all like me  
Somewhat unlike me  
Neutral  
Somewhat like me  
Very much like me

**32. My overall feelings about myself are heavily influenced by how good I look** *(Optional)*

Not at all like me  
Somewhat unlike me  
Neutral  
Somewhat like me  
Very much like me

**33. Even in the face of rejection, my feelings of self-worth remain unaffected** *(Optional)*

Not at all like me  
Somewhat unlike me  
Neutral  
Somewhat like me  
Very much like me

---

### **Final Page**

Thank you very much for taking the time to complete this questionnaire.

**In a week's time you will receive an e-mail with a web link to the second questionnaire. Please try and complete the questionnaire as soon as you receive this email.**

If you have any questions about the study please contact me (Camilla During) via email ([c.during@sussex.ac.uk](mailto:c.during@sussex.ac.uk)).

---

## **Time 2**

**All participants completed the following sections:**

### **Questionnaire Time 2**

#### **Thank you for agreeing to take part in this study**

Participation in this study entails completing three online questionnaires. This questionnaire is the **second** part of our **three -part** study, and I shall be contacting you in a week's time with the link to the third and final questionnaire.

In this questionnaire, you will initially be asked to answer some questions about your alcohol consumption and your personality. You will then be asked to read some health-related information and to give your responses to this. This questionnaire should take about **10-15 minutes** to complete.

Participants who complete both questionnaires will be entered in to a prize draw with the chance of winning **£100!**

#### **You are welcome to take part if you are:**

FEMALE

Over the age of 18

Fluent in written and spoken English

#### **PLEASE NOTE:**

You are under no obligation to take part in this study. Participation is purely voluntary and you are free to withdraw at any time until it is no longer practical for you to do so.

All of the information that you give will be treated confidentially.

Your name and e-mail address will be deleted from all files once the prize draw has been conducted and your answers will be stored anonymously from that point onwards.

Your email address will only be used to contact you for the purpose of this study.

**Please read the instructions carefully and answer the questions in the order they appear on the page.**

**You will not be able to return to a page once you have clicked the continue button.**

**By clicking on the "Continue" button, you are indicating that:**

- You consent to the processing of your personal information for the purposes of this research study.
  - You understand that such information will be treated as strictly confidential and handled in accordance with the Data Protection Act 1998.
-



**Please answer the following questions**

- 1. Please enter today's date (dd/mm/yyyy) (Optional)**  
(DD-MM-YYYY)
- 2. Please enter your e-mail (This is vital information so we can contact you with the second and third part of the study, and so you can be contacted if you are the winner of the prize draw). (Optional)**

- 3. Please enter your name**  
(Optional)
- 

**Alcohol consumption**

Now I would like to ask you some questions about your alcohol consumption

**In the past seven days**, how much alcohol did you drink? Below, please could you detail the types of drinks (i.e., beer, wine, spirits), types of containers (i.e., small glass, can, pint, single or double measure) and number of each of these drinks consumed on each day of the last week.

**An example would be, 1 can of Stella and 1 bottle of Smirnoff Ice.**

- 4. Monday (Optional)**
  - 5. Tuesday (Optional)**
  - 6. Wednesday (Optional)**
  - 7. Thursday (Optional)**
  - 8. Friday (Optional)**
  - 9. Saturday (Optional)**
  - 10. Sunday (Optional)**
- 

**Participants in the self-affirmation condition completed the following section:**

**Personal Attributes Survey**

**The following questions are designed to measure your personal attributes. These questions refer to behaviours that YOU have performed. As you read each question, please try to recall a time when YOU performed each behaviour. There are no right or wrong answers, so please be as honest as possible. Please tick the box next to the answer that best describes your behaviour. If you answer YES to**

**any of the questions, please provide a short example of the last time you performed this behaviour.**

**16. Have you ever forgiven another person when they have hurt you? (Optional)**

Yes No

If Yes, example (Optional)

**17. Have you ever been considerate of another person's feelings? (Optional)**

Yes No

If Yes, example (Optional)

**18. Have you ever been concerned with the happiness of another person? (Optional)**

Yes No

If Yes, example (Optional)

**19. Have you ever looked out for another person's interests before your own? (Optional)**

Yes No

If Yes, example (Optional)

**20. Have you ever been generous and selfless to another person? (Optional)**

Yes No

If Yes, example (Optional)

**21. Have you ever attended to the needs of another person? (Optional)**

Yes No

If Yes, example (Optional)

**22. Have you ever tried not to hurt the feelings of another person? (Optional)**

Yes No

If Yes, example (Optional)

**23. Have you ever felt satisfied when you've helped another person? (Optional)**

Yes No

If Yes, example (Optional)

**24. Have you ever gone out of your way to help a friend even at the expense of your own happiness? (Optional)**

Yes No

If Yes, example (Optional)

**25. Have you ever found ways to help another person who was less fortunate than yourself? (Optional)**

Yes No

If Yes, example (Optional)

---

**Participants in the control condition completed the following section:**

**Personal Attributes Survey**

**The following questions are designed to measure personal opinions. These questions refer to YOUR opinions on each topic. There are no right or wrong answers, so please be as honest as possible. Please tick the box next to the answer that best describes YOUR opinion. If you answer YES to any of the questions, please provide a reason why you believe this statement to be true.**

**16. I think that the color blue looks great on most people (Optional)**

Yes No

If Yes, example (Optional)

**17. I think that chocolate is the best flavor for ice cream (Optional)**

Yes No

If Yes, example (Optional)

**18. I think that winter is the most satisfying season during the year (Optional)**

Yes No

If Yes, example (Optional)

**19. I think that the most aromatic trees in the world are pine trees (Optional)**

Yes No

If Yes, example (Optional)

**20. I think that cooking is an important skill to possess (Optional)**

Yes No

If Yes, example (Optional)

**21. I think that houseplants help to brighten a home (Optional)**

Yes No

If Yes, example (*Optional*)

**22. I think that sewing is an important skill to possess** (*Optional*)

Yes No

If Yes, example (*Optional*)

**23. I think that the beach is a great place to vacation** (*Optional*)

Yes No

If Yes, example (*Optional*)

**24. I think that the subway is the best form of public transportation** (*Optional*)

Yes No

If Yes, example (*Optional*)

**25. I think that fruit makes the best dessert** (*Optional*)

Yes No

If Yes, example (*Optional*)

**All participants then completed the following sections:**

**Alcohol and Breast Cancer**

**Please now read the following information carefully**

A new major international study has found an **important link between alcohol consumption and breast cancer**. The research, from Cancer Research UK and published in the British Journal of Cancer estimates that **alcohol accounts for approximately 4% of breast cancers and around 2,000 cases each year in the UK alone**.

Co-author Professor Valerie Beral of Cancer Research UK's Cancer Epidemiology Unit at the Radcliffe Infirmary in Oxford, said: " This research tells us there is a definite link between alcohol and breast cancer and the evidence suggests that the more a woman drinks the greater her risk".

Two large combined reviews of the published evidence, and the UK Million Women Survey showed an increase in risk of breast cancer of about **7% to 12%** with every extra unit of alcohol per day. One unit is a half pint of beer, a small glass of wine or a measure of spirits.

The average daily alcohol intake for UK women has increased from about 7 grams to 8 grams per day in the last decade, but for young women the increase has been even greater. **This increase in alcohol consumption could have a significant impact upon breast cancer incidence.**

Alcohol can increase levels of estrogen and other hormones associated with certain types of breast cancer. **Alcohol may also increase breast cancer risk by damaging DNA in cells.**

Breast cancer is by far the most common cancer in women in the UK, accounting for 31% of all new cancer cases. Breast cancer is also the second most commonly diagnosed cancer in women under 35.

**If you want to do everything you can to lower your breast cancer risk, limiting how much alcohol you drink makes sense.**

---

**26. What sort of disease does the previous piece of text relate to alcohol consumption?** *(Optional)*

---

**Please answer the following questions about your thoughts and feelings about alcohol consumption**

**Please click on the button to the left of the response that best represents how you feel**

**Your thoughts and feelings**

**22. For me to reduce the amount of alcohol I consume over the next 7 days would be**

Extremely bad  
 Bad  
 Slightly bad  
 Neither bad nor good  
 Slightly good  
 Good  
 Extremely good

**23. For me to reduce the amount of alcohol I consume over the next 7 days would be**

Extremely harmful  
 Harmful  
 Slightly harmful  
 Neither harmful nor beneficial  
 Slightly beneficial  
 Beneficial  
 Extremely beneficial

**24. I intend to reduce the amount of alcohol I consume over the next 7 days**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**25. For me to reduce the amount of alcohol I consume over the next 7 days would be**

Extremely unpleasant  
 Unpleasant  
 Slightly unpleasant  
 Neither unpleasant nor pleasant  
 Slightly pleasant  
 Pleasant  
 Extremely pleasant

**26. Most people who are important to me think I should reduce the amount of alcohol I consume over the next 7 days**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**27. The people in my life whose opinions I value would approve of me reducing the amount of alcohol I consume over the next 7 days**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**28. For me to reduce the amount of alcohol I consume over the next 7 days would be**

Extremely unenjoyable  
 Unenjoyable

Slightly unenjoyable  
Neither unenjoyable nor enjoyable  
Slightly enjoyable  
Enjoyable  
Extremely enjoyable

**29. If I wanted to I could reduce the amount of alcohol I consume over the next 7 days**

Disagree strongly  
Disagree  
Disagree slightly  
Neither agree nor disagree  
Agree slightly  
Agree  
Agree strongly

**30. For me to reduce the amount of alcohol I consume over the next 7 days would be**

Extremely worthless  
Worthless  
Slightly worthless  
Neither worthless nor valuable  
Slightly valuable  
Valuable  
Extremely valuable

**31. If I did not reduce the amount of alcohol I consume over the next 7 days, I would feel regret**

Disagree strongly  
Disagree  
Disagree slightly  
Neither agree nor disagree  
Agree slightly  
Agree  
Agree strongly

**32. I will try to reduce the amount of alcohol I consume over the next 7 days**

Disagree strongly  
Disagree  
Disagree slightly  
Neither agree nor disagree  
Agree slightly  
Agree  
Agree strongly

**33. I think of myself as the sort of person who would want to reduce the amount of alcohol I consume over the next 7 days**

Disagree strongly  
Disagree  
Disagree slightly  
Neither agree nor disagree  
Agree slightly  
Agree  
Agree strongly

**34. Reducing the amount of alcohol I consume over the next 7 days is an important part of who I am**

Disagree strongly  
Disagree  
Disagree slightly  
Neither agree nor disagree  
Agree slightly  
Agree  
Agree strongly

**35. I am not the type of person who would reduce the amount of alcohol I consume over the next 7 days**

Disagree strongly  
Disagree  
Disagree slightly  
Neither agree nor disagree  
Agree slightly  
Agree  
Agree strongly

**36. I believe I have complete control over reducing the amount of alcohol I consume over the next 7 days**

Disagree strongly  
Disagree  
Disagree slightly  
Neither agree nor disagree  
Agree slightly  
Agree  
Agree strongly

**37. I plan to reduce the amount of alcohol I consume over the next 7 days**

Disagree strongly  
Disagree



Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**38. It is mostly up to me whether I reduce the amount of alcohol I consume over the next 7 days**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**39. I would feel regret if I did not reduce the amount of alcohol I consume over the next 7 days**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**40. For me to reduce the amount of alcohol I consume over the next 7 days would be**

Extremely impossible  
 Impossible  
 Slightly impossible  
 Neither impossible nor possible  
 Slightly possible  
 Possible  
 Extremely possible

**41. I feel a strong obligation to reduce the amount of alcohol I consume over the next 7 days**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**42. Not reducing the amount of alcohol I consume over the next 7 days would go against my principles**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**43. If I didn't reduce the amount of alcohol I consume over the next 7 days it would play on my conscience**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**44. Reducing the amount of alcohol I consume over the next 7 days would feel like I was doing the morally right thing**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**45. Most people I know try to reduce the amount of alcohol they consume**

Disagree strongly  
 Disagree  
 Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

**46. Most people who are important to me try to reduce the amount of alcohol they consume**

Disagree strongly  
 Disagree

Disagree slightly  
 Neither agree nor disagree  
 Agree slightly  
 Agree  
 Agree strongly

### **Final Page**

**Thank you for taking the time to complete this questionnaire.**

In a week's time you will receive an e-mail with a web link to the final questionnaire.  
 Please try and complete the questionnaire as soon as you receive this email.

---

### **Time 3**

**All participants completed the following sections:**

#### **Questionnaire Time 3**

**Thank you for agreeing to take part in this study**

This questionnaire is the third and final part of this study. This questionnaire entails answering some questions about your alcohol consumption. It will take you no more than 5 minutes to complete.

Participants who complete all three questionnaires will be entered in to a prize draw with the chance of winning **£100!**

**You are welcome to take part if you are:**

FEMALE

Over the age of 18

Fluent in written and spoken English

PLEASE NOTE:

You are under no obligation to take part in this study. Participation is purely voluntary and you are free to withdraw at any time until it is no longer practical for you to do so.

All of the information that you give will be treated confidentially.

Your name and e-mail address will be deleted from all files once the prize draw has been conducted and your answers will be stored anonymously from that point onwards.

Your email address will only be used to contact you for the purpose of this study.

**Please read the instructions carefully and answer the questions in the order they appear on the page.**

**You will not be able to return to a page once you have clicked the continue button.**

**By clicking on the "Continue" button, you are indicating that:**

- You consent to the processing of your personal information for the purposes of this research study.
  - You understand that such information will be treated as strictly confidential and handled in accordance with the Data Protection Act 1998.
- 

## About you...

Top of Form

**Please answer the following questions**

- 1. Please enter today's date (dd/mm/yyyy) (Optional)**  
(DD-MM-YYYY)
  - 2. Please enter your e-mail (so you can be contacted if you are the winner of the prize draw) (Optional)**
  - 3. Please enter your name**  
(Optional)
- 

## Alcohol consumption

Now I would like to ask you some questions about your alcohol consumption

Top of Form

**In the past seven days**, how much alcohol did you drink? Below, please could you detail the types of drinks (i.e., beer, wine, spirits), types of containers (i.e., small glass, can, pint, single or double measure) and number of each of these drinks consumed on each day of the last week.

**An example would be, 1 can of Stella and 1 bottle of Smirnoff Ice.**

- 4. Monday (Optional)**
- 5. Tuesday (Optional)**
- 6. Wednesday (Optional)**
- 7. Thursday (Optional)**
- 8. Friday (Optional)**
- 9. Saturday (Optional)**

## 10. Sunday *(Optional)*

---

Thank you for taking the time to complete this questionnaire

You will now be entered into the prize draw, and will be contacted via email if you are one of the winners.

This study was designed to explore whether contemplating past actions of kindness would influence your responses to information about the risks of alcohol consumption. Therefore some of you were asked to contemplate previous acts of kindness, whilst some of you were asked to contemplate your opinions on some topics (e.g., favourite ice-cream flavour), before reading the information about the risks of alcohol consumption.

In addition, we were interested in exploring how your personal traits might influence your responses to the information about alcohol. Therefore, the first questionnaire asked you a number of questions designed to assess your self-esteem.

If you would like to withdraw your questionnaire now that you know the purpose of the study and/or you would like more information about this study, please contact me (Camilla During) via email ([c.during@sussex.ac.uk](mailto:c.during@sussex.ac.uk)).

**If you would like more information about alcohol and breast cancer and how to decrease the amount you alcohol you drink you may find the following websites useful:**

Cancer Research UK (alcohol and breast cancer):  
<http://www.cancerresearchuk.org/cancer-help/about-cancer/cancer-questions/alcoholand-breast-cancer>

NHS Choices (alcohol and breast cancer):  
<http://www.nhs.uk/news/2011/04April/Pages/drinking-alcohol-increased-cancerrisk.aspx>

BBC Health (alcohol and breast cancer):  
<http://www.bbc.co.uk/news/health-15539450>

NHS Choices (alcohol): <http://www.nhs.uk/livewell/alcohol/Pages/Alcoholhome.aspx>

NHS Choices (breast cancer in women):  
<http://www.nhs.uk/Conditions/Cancer-of-the-breast-female/Pages/Introduction.aspx>

NHS Choices (breast cancer in men):  
<http://www.nhs.uk/conditions/cancer-of-the-breast-male/pages/introduction.aspx>

**If you would like more information about what services are available to you if you are worried about your levels of alcohol consumption or risk of breast cancer, you may find the following website useful:**

NHS

Services:

<http://www.nhs.uk/Service-Search/>